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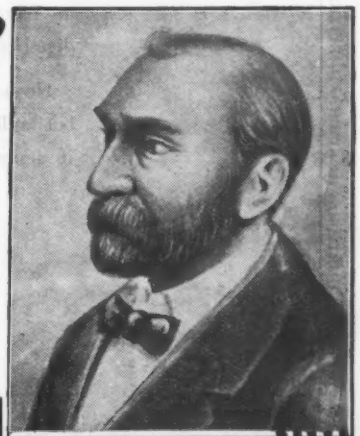

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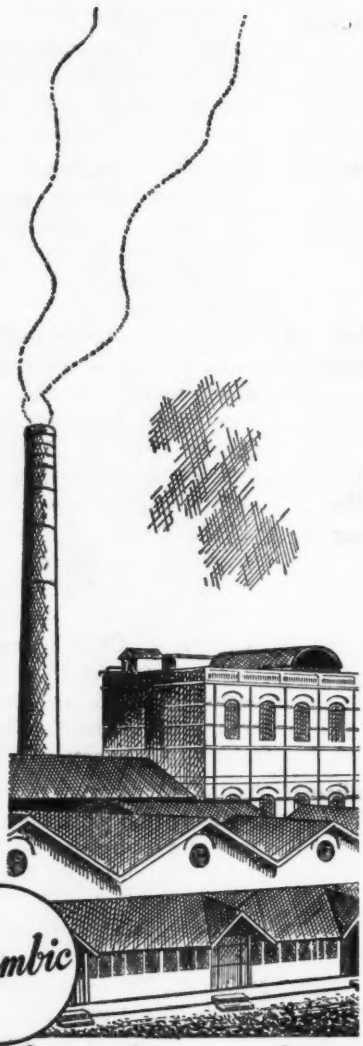

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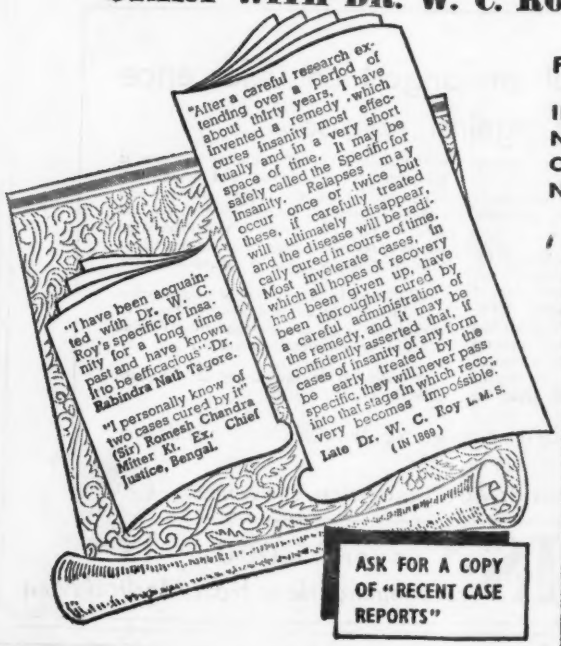
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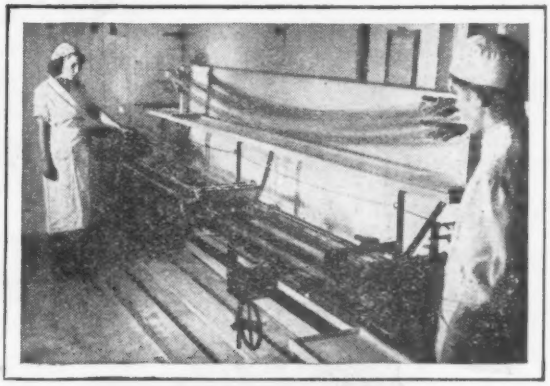

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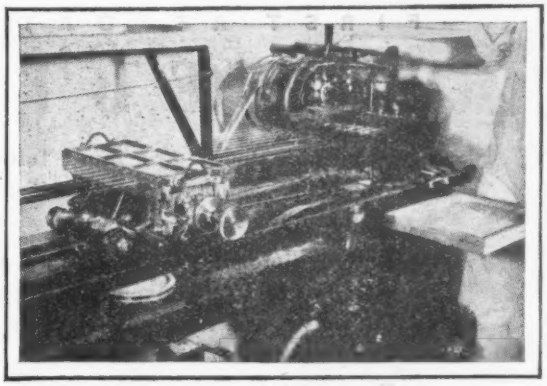

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Robert Koch in 1884 was the first to think that the manifestation of cholera depends on the action of the specific toxin of the vibrio absorbed from the alimentary tract of the cholera patient. Since then various workers have been attempting to isolate the toxin and base its specificity on experimental grounds. The next year witnessed a series of workers who tried to find out the metabolic products of the cholera vibrio. Van Ermengem (1885) injected guineapigs intraperitoneally with the culture filtered through the Pasteur-Chamberland porcelain filter and found the animals dying after 3-4 days with similar symptoms. These results have been obtained by a series of other workers. Even at this earlier state it was realised, as Huppe (1887) mentions, that this toxic substance in the filtrate is not the sought for specific toxin as the material has been obtained from a growth several weeks old. Huppe established, further, the two main principles *e.g.*, (1) the growth of the organism in the intestines takes place under anærobic conditions and (2) the organisms get their nourishment in the intestines from genuine or at least relatively altered protein and not from disintegrated protein. In his work on cholera toxopeptone with egg albumen, Scholl (1892) found that the greatest amount of toxin is found by anærobiasis.

Attempts to isolate the specific toxin of the cholera vibrio have been made by various workers since then. It attracted special attention from its similarity to the toxins of diphtheria and tetanus in that in none of these infectious diseases the organism circulates in the blood while the toxic manifestations are profound and serious. During these attempts various methods have been adopted yielding substances showing various toxic effects in laboratory animals. Rogers and Megaw (1930) believe that cholera vibrio produces both a soluble exotoxin and an endotoxin. They believe also that there are two kinds of toxins, one a soluble thermolabile substance of a colloidal nature, which is antigenic and is neutralised by an antitoxic serum, and the other a thermolabile endotoxin formed in much smaller quantity and only one-fifth as toxic and is not neutralised by the antitoxic serum.

Such eminent workers *e.g.*, Kraus and Pribram (1905), Metchnikoff, Roux and Salimbeni (1896), Brau and Denier (1906) and others obtained toxic materials in the bacteria-free culture fluid by using cultures which had been several days old, thereby causing the death of a large number of vibrio in the culture medium and so liberating the endotoxin free in the medium by their disintegration. This toxic product as a result of disintegration is not regarded to be the true toxin. In order to eliminate this factor Hahn and Hirsch (1926, 1927, 1929) have recently elaborated a method in which they used a very young culture, a growth of 6-10 hours, thus eliminating the possibility of death and disintegration of the vibro in the medium. This method has been followed with favourable results by others notably Andu and Niekerk (1929), Soeleiman and Niekerk (1930) and Ghose (1933). Unfortunately the method adopted by Hahn

and Hirsch is rather cumbrous. The researches by eminent workers during this period of more than 50 years place at our disposal a rich material but unfortunately a closer study reveals a wide divergence of opinion regarding the possibility of isolating a true specific toxin and if it can at all be successfully isolated, its nature and mode of isolation. Following the main principle elaborated by previous workers but using a different culture medium and quite a different technique, a substance has been obtained by the present writer which shows itself to be of much toxicity.

Prepartion of Cholera Toxin

The cholera toxin prepared in the present work has been obtained by fishing out and modifying procedure described by other workers under the guidance of Prof. Besredka in the Institute Pasteur, Paris.

The Strain of the Vibrio for Producing the Toxin

It is a noticable feature that all strains of cholera vibrio are not equally efficient for toxin production even when they are isolated from a case showing extreme toxicity clinically. Preservation of a toxin-producing strain has been found to lose its property in a short time. It has also been observed that only a few strains of vibrio produce the toxin *in vitro* while a large number of strains preserved in the laboratory are ineffective for this purpose.

In the present study 10 strains of cholera vibrio isolated in Calcutta from cholera cases are used which have been kept in the laboratory for 6-12 months. Of these strains, one is found to be of most toxicity.

The number of organisms required—That the ideal method is to get a maximum growth of the organism in a short period is recommended by all of them. Gotschliech and Weigang (1895) have shown that the increased virulence of a cholera culture depends entirely on the number of living organisms in it. Gotschliech (1929) calls attention to the fact that under identical conditions the intensity of multiplication is the exact measure of the living energy of a culture. With a view to that end Hahn and Hirsch (1929) made extensive researches to find out a suitable culture medium and they found that the addition of glucose to the medium is essential, particularly as they used an anærobic culture. It had been the opinion of the day that cholera vibrio does not grow anærobically in any condition. Hirsch (1926) has reported that it grows luxuriantly only when glucose is present. This has been confirmed by the subsequent works of Hahn and Hirsch and also in our own hands. Our findings (Banerjee 1938) are shown in the following table. The figures are in millions.

Nature of culture		*Number of hours*			
		3	6	9	12
Ordinary bouillon	Anærobic ..	12	40	100	240
	Aerobic ..	50	500	2,200	4,500
Ordinary bouillon with 0·2% glucose	Anærobic ..	20	600	1,800	3,200
	Aerobic ..	45	750	2,500	4,000
Ramon's medium with 0·2% glucose	Anærobic ..	23	700	2,200	3,600
	Aerobic ..	50	750	2,400	4,200

Hahn and Hirsch further show that every thing remaining same, one 8 hour old cholera bouillon culture with addition of 0·2 per cent glucose produces 4 milliard organisms per ccm. as against 136 million in a sugar free medium. In contrast to this, Ghose (1933) who has worked with anærobic culture with Martin's bouillon found that addition of glucose diminishes the production of toxin.

Apart from the addition of glucose to the medium, the reaction of the same has been noticed to be of greater importance. Cholera vibrio always produces acid in the medium and as the acid production increases, the growth becomes less and less. This close relationship between the reaction of the media and the number of organisms is clearly shown by Hahn and Hirsch. In order to keep the reaction within optimum limits they have devised an ingeneous method, although very cumbrous, but admirably suitable for this purpose. They have also materially changed the composition of the culture medium so far as the buffers are concerned. By this means, *i.e.*, by addition of 0·2 per cent glucose and adequate buffers and also keeping the constant pH of 7·6 to 8, they could obtain in 6-10 hours a maximum growth of the cholera vibrio. In the present study, an attempt is first made to find out a glucose containing medium which will maintain a fairly constant pH of about 8 and at the same time allow the vibrio to grow luxuriantly. The rather cumbrous process of Hahn and Hirsch has been successfully substituted by the use of Ramon's (1933) medium which contains sufficient amount of buffers in the form of sodium acetate (5-10 grm. per litre). This was selected at the suggestion of Noel Bernard (1937) who found little change of pH with this medium. In fact, Bernard,

Guillerm and Gallot (1937) found that after 8 days growth of cholera vibrio at 37°C, the filtrate showed pH at about 8·4 although the pH before inoculation was 8. In our own observation (Banerjee, 1938) it has been found that marked change in pH takes place in both anærobic and ærobic culture in bouillon with or without 0·2 per cent glucose and that within a period of 6 hours while with Ramon's medium no change of pH takes place even when kept for several days.

A comparative study is then made with (1) ordinary bouillon, (2) bouillon with 0·2 per cent glucose and (3) Ramon's medium with 0·2 per cent glucose. Ordinary bouillon with or without glucose gives a rapid change of pH within 6-12 hours even with periodical addition of 1 to 2 c.cm. of NaOH during this period of growth. This takes place both with ærobic and anærobic cultures. Ramon's medium, on the other hand, with initial pH of 8·2 shows little or no change of pH during the first ten hours of growth and only reaches to 8 in 24 hours even with a heavy seed culture. This is found to be true with both ærobic and anærobic cultures. So this medium has been found by us to be most suitable for this work.

Gildemeister and Neustat (1934) have described a method by which the quantity of the medium and time remaining same, 100 times more organisms are grown. This is by growing the organism is a cellophane sac surrounded by ordinary bouillon. Further, as the toxin cannot pass through cellophane sac (Hahn and Hirsch), this is tried in the present work and is found to be extremely satisfactory. Gildemeister and Grillo (1935) have used the method for Shiga toxin and McClean (1937) has used the same technique in the study of staphylococcus toxin. The observation of Birch and Hirschfeld (1933) that cultivation of staphylococcus on a sheet of cellophane placed over a blood agar plate considerably increased the potency of the resulting hæmolysis when compared with that produced on an agar plate alone had become more alluring to me in cholera toxin work to use cellophane sacs. So in order to get the maximum number of organisms in the shortest time cellophane sacs have been used in the present study. The method of its use is detailed below:

Here the method adopted by Gildemeister and Neustat with slight modification has been followed. The 3-necked flask is replaced by a long cylinder in which 2 cellophane sacs are placed, each tied tightly with string to a tube open at both ends. The length of the tubes are adjusted so that they project through the opening of the cylinder. The open ends of the glass tubes and the cylinder are plugged with cotton wool. 200 c.c. of Ramon's medium is put in the cylinder outside the sacs and 50 c.cm. of the same medium is put in the sacs through the glass tube. This is then sterilised in the autoclave and dialysis was allowed to proceed overnight at room temperature. In another similar apparatus oil of vaseline is put in the cylinder and also in the sacs so as to float on the surface to serve as anærobic culture. This "diffusate medium" is inoculated *in situ*, with 1/5th of the agar slant culture of 24 hours growth of cholera vibrio and then the whole apparatus is incubated at 37°C. for 18 hours. The cellophane bag is then removed from the cylinder, emptied by snipping with scissors.

A further modification of the above technique has been made during the subsequent study of the toxin of the cholera vibrio.

In the above technique both the cylinder and the cellophane sacs were filled up with Ramon's medium, *i.e.*, the same medium existed both inside and outside the cellophane sacs and the "diffusate medium" consisted of the fluid as a result of dialysis of the same medium through the cellophane.

In the modified technique normal saline has been used inside the cellophane sac instead of Ramon's medium and dialysis allowed overnight. Next morning, it is found that the "diffusate medium" which was originally only saline, has taken a tinge of yellow colour of the Ramon's medium. Comparative tests are now made regarding the growth of the cholera vibrio in the two forms of the "diffusate media" *i.e.*, Ramon's medium and normal saline used inside the sac. The growth, as judged by opacity of the media, appears to be equally luxuriant in both. The growth in the saline diffusate medium is then collected into centrifuge tube and centrifuged at high speed for 20 minutes. The supernatant fluid although clear is never bacteria-free. These organisms are killed by passing a current of air containing a mixure of toluol and chloroform through the fluid. This method is adopted as it has also been observed by other workers that considerable portion of the toxic elements are removed by candle filters.

The quantity and nature of the seed are also important factors. During the early part of this study a loopful of the seed from 18 hours old agar culture was used to inoculate the Ramon's medium. The toxin

obtained from this was found to be very small in quantity. So subsequently a large quantity of seed culture was used to get the desired result. The age of the culture is also important. Gotschliech and Weigang (1895) have shown that the time of growth plays a very important role regarding he grade of virulence. They have found that younger the culture, the more the virulence. This they attribute to the number of living organisms in the medium. They have found that the number of living organisms diminish so rapidly that in a 48 hour old culture at 37° only 10 per cent of living organisms are found than that of 12-16 hours old growth.

Anærobic culture—The idea of cultivating the cholera vibrio anærobically for the isolation of toxin is due to Huppe (1887) who pointed out that in human cases of cholera the toxin is produced in the intestines as an anærobic condition exists in that place. As all the recent workers on cholera toxin have found anærobic culture to be most suitable both ærobic and anærobic methods have been employed in the present study.

Filtration of the medium to secure the toxin—The usual method of obtaining the toxin filtrate is by filtering through Pasteur-Chamberland or similar filters. In fact, this had been the method of choice. Hahn and Hirsch have made the culture bacteria-free by using Seitz filters or by centrifugalisation. By centrifugalisation although the supernatant fluid appears clear but it is never free from bacteria. This is particularly true to cholera vibrio because of the active motility whereby they appear in the clear fluid within a very short time. These organisms are killed by passing a current of air containing chloroform or a mixture of toluol and chloroform through the fluid. Ghose (1933) used L3 candle filter to obtain the toxin. On the other hand, other workers particularly Russ (1916) found that considerable portion of the toxic elements are removed by filters. Woolpart and Dack (1933) found some selective action with the Seitz-filtration, which removes a much lower proportion of the entero-toxin than of the hemotoxin, dermotoxin and killing toxin.

In the present study the method used by Hahn and Hirsch (1927) has been used which consists in centrifugalisation and then killing the organisms by passing a current of air containing chloroform and toluol through the supernatant fluid.

Study of the Toxin

The titration of the toxic properties of the material has been used under 3 heads—

(1) Dermotoxin—by intradermic injection into guineapig.

(2) Killing toxin as demonstrated in guineapig weighing 200-250 grm. by intraperitoneal injection.

(3) Killing toxin as demonstrated in white mice by intravenous injection.

The killing dose is reckoned as the smallest dose which will kill a guineapig in 24 hours showing toxic manifestations.

1. Intradermic reaction—The materials derived by filtering the 6 cultures are injected intradermically into the shaven skin of guineapigs. Readings were taken in from 24-48 hours. The cultures are—(1) ordinary bouillon without glucose, (2) bouillon with 0·2 per cent glucose, and (3) Ramon's bouillon with 0·2 per cent glucose. These three cultures are cultivated ærobically and anærobically.

Results—Hyperæmia without infiltration noticed in areas injected with 0·5 c.c. of filtrate. The reactions are more or less common with all the 6 filtrates. No reaction is noticed with a dose smaller than 0·5 c.c. with filtrate of cultures.

2. Killing toxin in guineapig intraperitoneally. (a) Guineapigs are injected intraperitoneally with filtrate of each of these 6 cultures in doses of 2 c.cm. and 1 c.cm. each.

Result—No death takes place in any of them during 48 hours, excepting that having 2 c.c. of the filtrate from anærobic culture on Ramon's bouillon. This shows that anærobic culture is more toxic than ærobic.

(b) Ramon's medium is used inside and outside cellophane sacs and also both ærobic and anærobic. Dose 1 c.c. and 2 c.c. The result is given in the following table.

Number of guineapig	Material	Dose	Duration of Experiment in days 1	2	3	4	5	6	7
1	18 hour's anærobic	2 c.c.	D						
2	growth in saline	2 c.c.	D						
3	diffusate.	2 c.c.	D						
4		1 c.c.				D			
5		1 c.c.		D					
6		1 c.c.			D				
7	18 hour's ærobic	2 c.c.	D						
8	growth in saline	2 c.c.	D						
9	diffusate.	2 c.c.	D						
10		1 c.c.				D			
11		1 c.c.							S
12		1 c.c.			D				

N.B. D denotes death and S survival

Thus it is found that all the animals, receiving 2 c.c. of the filtrate from culture both ærobic and anærobic, died within 24 hours and nearly all died within 4 days. The minimum lethal dose is thus 1 c.c. of the filtrate.

3. Killing dose in mice intravenously.

The M. L. D. of the filtrate are detected by intravenous injection into 15-20 grm. mice. The period of observation was 7 days. Mice have been used in preference to rabbits as this animal is selected by a large number of workers on dysentery toxin particularly by Gildemeister and Grillo (1935), Petrie (1927) and others.

The result is tabulated as follows:

Intravenous Injection into White Mice.

No. of mouse	Material	Dose in c.c.	Duration of experiment in days 1	2	3	4	5	6	7
1	18 hour's anærobic	0·5	D						
2	growth in saline	0·5	D						
3	diffusate	0·5	D						
4		0·5	D						
5		0·25			D				
6		0·25		D					
7		0·25				D			
8		0·25				D			
9		0·1							S
10		0·1							S
11		0·1					D		
12		0·1							S
13	18 hour's ærobic	0·5	D						
14	growth in saline	0·5	D						
15	diffusate	0·5	D						
16		0·5	D						
17		0·25					D		
18		0·25							S
19		0·25						D	
20		0·25					D		
21		0·1							S
22		0·1							S
23		0·1							S
24		0·1							S

N.B. D denotes death and S survival.

The minimum lethal dose is thus found to be 0·25 c.c.

Conclusion

A technique for the isolation of toxin from the cholera vibrio is described which is further modified by using only normal saline in the cellophane sac surrounded by Ramon's medium with 0·2 per cent glucose. The toxicity is found to be same in case whether the Ramon's medium or only saline is used inside the sac.

Acknowledgment

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IMMUNITY RESPONSE TO NONSPECIFIC ANTIGENS

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In a previous communication, Mukherjee *et el* (1938) while discussing on the comparative efficacy of different protein antigens, stressed on the importance of adjusting the dosage, time interval etc., while persuing the course by parenteral administration.

Protein antigens, more frequently used in our country are in the form of *1. Milk protein (Aolan), 2. T. A. B. vaccine, 3. Protozoal vaccine (Protodin), 4. Albu-lipins (Sterodin), lipoids from bile, various bacteria etc., in combination with albuminoids.

But it must be remembered that every soluble protein may in some degree act as an antigen. Toxic glucosides and various lipoids may also act in the same capacity.

The manifestation of the defensive reaction, provoked by the parenteral administration of foreign protein antigens, is a variable phenomenon. It varies from an imperceptible one, to an extreme shock associated with high fever, profound vasomotor disturbances and other constitutional phenomena and has been found to depend on the (*i*) Substances injected, (*ii*) dosage, (*iii*) mode of parenteral administration, (*iv*) physical condition of patient and (*v*) number of previous injections.

1. *Substances injected*—While the method of preparation of the non-specific protein antigens, unquestionably exerts some influence upon immunising capacity; the immunity response to antigens from different sources, *viz.*, from milk, protozoa, bacteria, etc. varies within wide limits. For example, an albu-lipin antigen has been found to exert the least constitutional disturbance, a vaccine of the colon bacillus has been seen to exert a severer reaction than typhoid vaccine and milk preparation from different manufacturers has seldom been found to give a concordant result, particularly in exciting constitutional symptoms. This variation may be due to a difference in the degree of antigenic activity or difference in the capacity of the immunity response of the body cells. This great variation in effects, the danger of eliciting too much reaction and the lack of standardised product, greatly complicates non-specific therapy.

* Names within brackets have been taken as representatives of the class.

Although the role of phagocytosis, as an index to immunity response is paramount, it is generally believed that the beneficial effect of foreign protein reaction (temperature and leucocytosis), is referable to fever and that upto a certain point, higher the fever better the result obtained. Ideas like these require yet to be substantiated by data.

Below, we append our observation on constitutional symptoms with four different protein antigens. It is from an average of five adult normal individuals injected intramuscularly by different antigens.

Antigens	*Local reaction*	*General reaction*
T. A. B. Vaccine 2 c.c. I. M. Typhoid 250mill per cc. Para A 200 „ „ „ „ B 200 „ „ „	Pain+++ Inflammatory reaction and swelling.	Chilly sensation; followed by pyrexia within 6-8 hrs., headache, nervous irritability etc.
Milk 5 c.c. I.M.	Pain++ slight erythema.	Do; Intensity—not so marked.
Protozoal vaccine 2 c.c. I.M.	Pain—nil.	Only feeling of ill being.
Albu-lipin. 2 c.c. I.M.	Pain in some cases	nil.

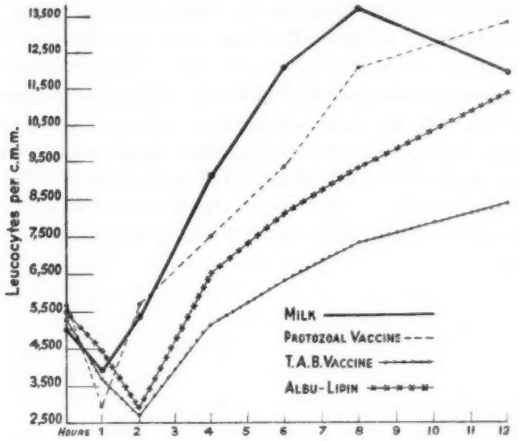
The course of any infection would, of course, depend upon the success or failure of the phagocytes to overcome the infection.

In applying this nonspecific stimulation therapy, three factors as have already been mentioned—dosage of injection, duration of interval and total amount to be used, must be considered. And this is no easy matter to decide, since various cells do not react to show uniform sensibility. Although the most important role in the process is played by leucocytes, other body cells have been found active in the process of phagocytosis.

After parenteral administration, " a leucopenia first appears. This is temporary and within 6-12 hours is followed by a leucocytosis," which usually reaches its maximum during this period. The reactive leucocytes are largely made up of polymorphonuclear leucocytes " The small lymphocytes are, however, much less active, probably they contain less of mobile cytoplasm " (Kolmer, 1925).

Below we reproduce graphical representation (Graph 1) of phagocytic activity, after parenteral administration of the different non-specific protein antigen. The figures are from the average of 10 cases

in each series and for reasons of convenience the values are approximated to the nearest round figure. The cases were healthy, normal, male adults.



GRAPH 1—Effect of Primary Stimulation on Leucocytic Response

One of the most difficult problem in non-specific protein therapy, is the want of suitable methods for the proper evaluation of the different brands of milk preparation. Animals have been used for the studies of physiologic effects of protein, but with the exception of Key's studies on the experimental iritis in rabbits there has been very little effort to test the value of foreign protein experimentally. It must, however, be mentioned here, that the result of human experiment does not agree with animal experimentation and as stated by Azinmer the nonspecific stimulation action on healthy individuals and in diseases are not the same. Investigation on the biochemical nature of the different nonspecific protein antigens might give us some clue for the assessment of the antigenic value of these agents

"The purpose of" active immunisation by specific or nonspecific antigens " is to gauge and time the different doses so that a pronounced or prolonged negative phase is prevented and a high positive phase is secured and maintained." (Kolmer 1925). From an analysis of the graph it will appear that after parenteral administration of 5 c.c., of milk, (Aolan)—primary stimulation, the negative phase lasts for 2 hours and the leucocytosis reaches its maximum within 8 hours after which it has a tendency to decline. And within next 12 hours, *i.e.*, within 24 hours after primary stimulation, the leucocytic count comes down to the initial or to a slightly higher level. The course of the leucocytic activity after primary stimulation with the different antigens are given below in a tabular form.

Leucocytes after Primary Stimulation

Antigen	*Duration of leucopenia.*	*Percentage of depression of leucocytes*	*Maximum leucocytosis.*
Milk ..	.. 1 hr.	25	8 hrs.
T.A.B. Vaccine	.. 2 hrs.	50	12 hrs.
Albu-lipin ..	.. 2 hrs.	40	12 hrs.
Protozoal Vaccine	.. 1 hr.	50	12 hrs.

From above it will appear that with none of the above antigens, the leucopenic activity lasts more than two hours. In repeating the injection consequently no extra importance need be placed on the question of negative phase.

The maximum leucocytic activity or response in all cases will appear to develop within 12-24 hours. Measured from quantitative activity, the activation of the leucoplastic tissues, within the period, after primary stimulation, will be found to be most marked with milk protein. Next in order comes protozoal vaccine, albulipin and bacterial protein.

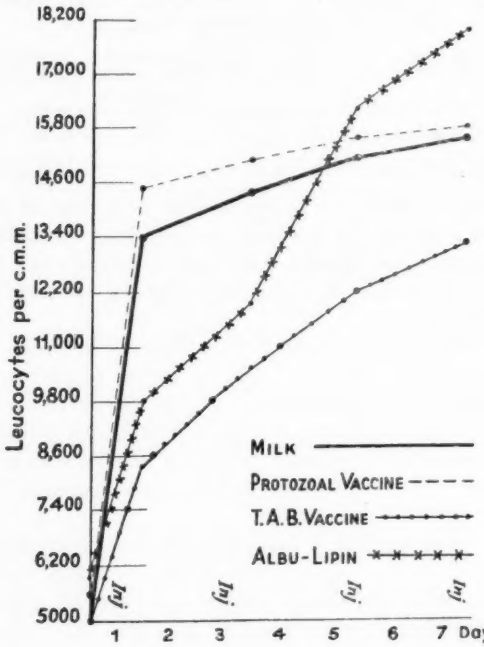
As in the field of therapeutic application the behaviour of the hæmopoietic system after secondary stimulation with non-specific antigen, is even of greater practical importance and so their behaviour was studied. It will be worth-while in this connection to mention that the optimum stimulation to an individual is different according to individual constitution, sex, age, kind of diseases and duration of illness. By injudicious application of secondary stimuli its action may even be suppressed and secondary side reaction may even develop in some cases.

From the adjoining graph it will be obvious that after parenteral administration of milk protein and protozoal vaccine the maximum leucocytic response comes on, within 12-24 hours, after initial injection and following this after repetition of injection there is no further reactivation of the leucocytes as will be evident from the flatness of the curve. (Graph 2).

With albu-lipin, however, after continuing the injection on four alternate days, the steepness of the curve will appear to be maintained—signifying that the leucocytes were still active, the maximum maintenance limit of which has not however been determined.

The influence of T.A.B. vaccine stimuli—"Although there is no doubt as to the importance of phagocytosis, in the mechanism of recovery, from infection, yet it was shown by Metchnikoff as early as 1893, that the body fluids contained substances that greatly facilitated

the phagocytic process" (Kolmer). To this substance is given the name opsonin.



GRAPH 2—Effect of Secondary Stimuli on Leucocytic Response.

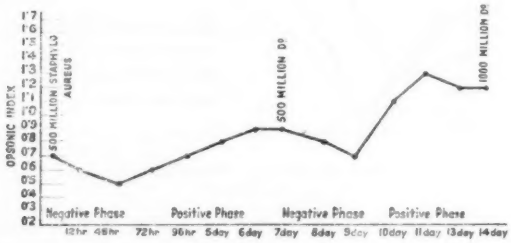
When the system is being invaded by some pathogenic micro-organism the leucocytes are increasing in number, while the tissue fluids facilitate phagocytosis not by stimulating the leucocytes, but by lowering the resistance of bacteria or in some way rendering them more vulnerable to phagocytosis.

Without entering into the controversial question of the nature and source of opsonin a quantitative estimation of the factor will be of great guide in relation to the specific or non-specific protein therapy to guard against diminishing the opsonin content of patient's blood. Such a procedure as a guide to therapeutic application is, however, beyond the reach of practical possibility.

Works on the lines, however, with different antigens will be taken up shortly and be reported in time.

But for the present we feel tempted to reproduce here a record of the quantitative estimation of the opsonic index after injection of a bacterial vaccine (staphylococcus aureus) (Graph 3). It is presumed that other bacterial vaccines will not probably behave in a totally different way except that gram positive micro-organisms have been found to excite a less severe reaction than gram negative ones.

(2) *Dosage*—When persuing a course of non-specific immunisation by non-specific medications we must be conscious of its limitation—we must bear in mind that there is a minimal threshold value, below which no response is obtained and above this value the immunity varies with the dose administered, but in such a way that increase in titre is relatively much smaller than the increase in dose administered to produce it. Eventually a point is reached at which further increase in doses results in little or no increase in antibody production.



GRAPH 3—An Opsonic Index Chart (Kolmer)

Considering the physical condition of the patient and the nature of the antigen, the severity of the reaction elicited by primary stimulation it is upto the clinician to calculate for himself, the subsequent doses for persuing the treatment. Dosage varies not only with the nature of the antigen, but also with factors, such as, age of the patient, nature of illness, route of administration, etc. In acute infective condition, in young children, dosage has to be proportionately small. The first dose should be purely an experimental one and subsequent doses must be controlled by local, focal, and general symptoms.

The time interval is another important factor to be considered. There ought to be no scheduled method as 3 days, 5 days or 7 days interval between the doses and reaction of the patient is the best guide. The dread of negative phase is all an exaggeration.

(3) *Mode of Administration*—(*a*) Intramuscular route. This is the route most usually chosen. The more usual sites are the outer and upper third of the arm, gluteal region, and the abdominal muscles depending upon the quantity of the antigen to be injected. (*b*) Intravenous route. Where elicitation of sharper reaction is in view this is the route advocated by some. But the risk of undesirable complication outweighs the

advantage. (*c*) Intradermal route. Some like to inject non-specific antigens by this route but the advantages claimed are of doubtful value.

(4) *Physical condition of individual*—Leucocytes vary in phagocytic activity in health and disease. Leucocytes at birth are far less active than in adults. It is well known that alcoholics stand very badly against any sort of infection. Ether, chloroform and other narcotics generally reduce resistance to infection by affecting the leucocytes. In febrile condition such as typhoid, pneumonia in which temperature of 102°-104°F already exists the temperature during a protein reaction may sometimes go upto 106°-107°F. For this reason, the dose of milk or T.A.B. vaccine, etc., if it has to be injected, should be very carefully gauged in the treatment of febrile condition. The absence of any general reaction following parenteral administration of albu-lipins, etc., does however, obviate this difficulty and complexity in treating acute febrile condition by non-specific means. In afebrile condition the leucocytic response reaches usually to 15,000 per c.mm., but in acute infectious diseases like pneumonia, it may reach as high as upto 50,000 per c.mm.

(5) *Number of previous injections*—Although in theory there is the possibility of shock due to miscalculated dosage and spacing of the injection but in practice, however, it has been found that no such danger actually occurs particularly with albu-lipin or protozoal vaccine, if the route of administration is intramuscular.

Summary

The antigenic value of the more commonly used non-specific antigens has been discussed, in terms of leucocytic response. Constitutional symptoms are most marked with T. A. B. vaccine and least with albu-lipin and protozoal vaccine.

With none of the antigens, the duration of negative phase lasts for more than 2 hours. The depression of leucocytes after injection of non-specific antigens is least with milk.

Measured from quantitative activity, leucocytic response after primary stimulation appears to be most marked with milk protein. Next best is the response from protozoal protein (vaccine).

In repetition of injection, albu-lipins appear to be decidedly the best, for it will be seen that within certain limits every fresh stimulation will provoke renewed reactivation of the leucocytes of the body tissue.

Acknowledgment

I wish to express my sincere thanks to Dr. B. B. Sen, M.SC., M.B. for giving me all facilities for work in the Serum Institute of India, Calcutta, and offering active co-operation and suggestion in the compilation of this work. My thanks as well go to Dr. P. K. Sarkar, B.SC., M.B., for his constant help throughout this work specially in the preparation of graphs.

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POSTERIOR SUBCAPSULAR OPACITIES OF LENS FOLLOWING RECURRENT ATTACKS OF UVEITIS

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Introduciton

In order to understand the pathological process of cataract formation it is necessary to review the recent additions which have been made to our conceptions of the metabolism of the normal lens (Duke-Elder, 1934). In all metabolic process the essential reaction is a reciprocal process of oxidation and reduction, which is mainly carried out by the respiratory gases mediated by the blood stream. In addition to this "external" respiratory mechanism, there is however, in most tissues an "internal mechanism which supplements the action

of the former. This "internal" mechanism of respiration can be carried out by two sorts of substances; one is esentially an enzyme, and the other is a more stable substance having the property of spontaneous oxidation and reduction.

The auto-oxidisable substance, which is present in the lens, is glutathione, which is a dipeptide of glutamic acid and cysteine. The important grouping in the molecule is the SH group, and it is readily susceptible to dehydrogenation (*i.e.*, oxidation) into an SS form In addition to this glutathione, there is another complementary substance in the lens, the so-called thermostable residue, which is capable of reducing the glutathione after it has been oxidised. In this way the two reactions are reversible, so that a balanced oxidation system is maintained in a state of constant equilibrium. The reaction may be graphically written as

$$2G.SH \rightleftharpoons G\text{-}S.S\text{-}G. + H_2.$$

It has been definitely established that the lens possesses an internal oxidation system, a concept initially suggested by Goldschmidt (1917). Goldschmidt (1917 and 1924), Abderhalden and Werthimer (1922), and Adams (1925) have shown that in lens glutathione acts as an auto-oxidisable constituent and β-crystalline acts as the thermostable residue. With increasing age and with maturation of cataract both the glutathine and β -crystalline decrease in parallel with the oxidation capacity of the lens. In an avascular structure such as lens, this internal oxidation system is very important, whereas in other parts of the body it only assumes a secondary importance. If in the lens, the internal oxidation system is partially put out of gear, it is likely that the transparency of the lens may suffer. An increase or derangement in the permeability of the lens capsule allows the abnormal entrance of fluid or electrolytes into the lens, which may readily lead to the coagulation of its proteins, which is recognised clinically as cataract; and on the other hand, it may facilitate the escape of glutathione from the lens, which is essential for its metabolic activity (Duke-Elder, 1934).

In cases of recurrent attacks of uveitis in the same person, where no definite etiological factor could be elicited, Duggan of New York (1940) suggests acute anoxia as the fundamental pathologic physiology. He thinks that the essential reason for this uveal disease has got a vascular basis. He made the statement that "the basic pathology is identical for acute exudative choroiditis, acute spastic closure of the central retinal artery, and acute retrobulbar neuritis. This process consists of arteriolar spasm, capillary dilatation, and increased capillary permeability with transudates of plasma, white cells and in severe cases erythrocytes. The result is tissue anoxia. The recurrence of similar lesions in the same person would seem to indicate that the vascular sensitivity is of fundamental importance in any study of the causation of acute chroiditis or the other pathologically similar lesions."

Recurrence of various types of uveal diseases are quite frequent like acute retrobulbar neuritis or multiple sclerosis. This indicates a specific tissue hypersensitivity or more precisely a localised hypersensitivity of the arterioles and capillaries in a particular tissue to circulating "toxins".

My explanation of this type of cataract following recurrent attacks of uvetis, either cyclitis or choroiditis, is that it interferes with the nutrition of the lens by deranging the permeability of the lens capsule which allows the abnormal entrance of more albuminous intraocular fluid or facilitates the escape of glutathione and produces coagulation of the lens protein. These cataractous changes do not follow a single attack of short duration but usually follows recurrent attacks of prolonged duration.

It was pointed out that if arteriolar spasm were the fundamental pathologic changes in these conditions, vasodilator therapy should be the treatment of choice because the purpose of vasodilator therapy is to improve the blood supply to the tissues, thereby relieving the tissue anoxia.

I wish to report below 3 cases of posterior subcapsular opacity of lens following recurrent attacks of uveitis. The etiology I accepted was "tissue anoxia" when I excluded all the other accepted causes, and I shall give below the results of vasodilator therapy with only sufficient atropine to keep the pupil fully dilated.

Report of Cases

Case I—Mrs. U. C. 33, H. F. came to my consultation room on 18th May, 1940. She complained of gradual failure of vision in both eyes. She first noticed it 4 years back. The acute attacks were usually followed by periods of quiescence when she could see better.

On examination her pupils were reacting to light, tension was normal, lacrimal sacs were healthy. no K. P. were found.

Vision—R. E. 6|36 no H. M. L. E. 6|18 no H. M.

Retinoscopy—R.E.—$\frac{+3}{+2\cdot5}$ L.E.—$\frac{+3}{+2\cdot5}$

Fundus examination B. E.:—Vitreous was very hazy. Floating opacities were present. Lental changes were found. Details of fundus could not be seen.

Slit lamp examination—Posterior subcapsular fine opacities and small iridescent crystals were seen.

Urine examination—nothing abnormal. W. R. negative. Blood sugar normal. Teeth—Bad pyorrhœa.

Treatment—Her pupils were kept fully dilated with atropine 1 per cent solution.

Pyorrhœa was treated. A course of subconjunctival sodium chloride 2 per cent was started, starting with 0·5 c.c. and gradually increasing the dosage. After 6 injections in each eye an interval of 1 month was allowed and then another 6 injections of 4 per cent sodium chloride was given. She was also given grs. 3 pot. iodide tablets B. D.

During the treatment she was improving. When she left my treatment in August her vision in R. E. was 6|12 and in L. E. 6|9.

Vitreous haze disappeared. Fundus could be seen and nothing abnormal found but some posterior subcapsular deposits in the lens remained in both the eyes, though much less than what was before.

Case II—B. K. S., 20 H. M. came to the Campbell Hospital out-patient department on 26.7.40 complaining of dim vision in L. E.

History—He had a rapidly oncoming dim vision in L. E. four years ago. After some time he got well. In March, 1940 he had another attack but got well in June. Now suddenly he got worse on 20th July, 1940.

26.7.40. Vision— R.E. 6|5. L.E.F.C. at 2 meters.

31.7.40. On dark room examination:—L. E. showed posterior subcapsular opacity of lens. Vitreous very hazy. Floating opacities present. Fundus details could not be seen. R. E.—fundus healthy. W. R. negative. Urine—nothing abnormal found. Teeth—good. Blood sugar not done.

14.8.40. A course of subconjunctival saline 2 per cent started and pot. iodide tablets grs. 3 given B. D.

24.8.40. Vision—R. E. 6|5. L. E. 6|24.
4.9.40. Vision—R. E. 6|5. L. E. 6|18.
18.9.40. Vision—R. E. 6|5. L. E. 6|9.
25.9.40. Vision—R. E. 6|5. L. E. 6|6.

Fundus quite clear. No vitreous haze. No subcapsular opacity of lens could be seen.

Case III—R. K. C. 25 H. M. came into my consultation room on 29.1.41, complaining of gradual failure of vision for the last three years which has come on slowly after repeated attacks.

Vision—R. E. 6|60. L. E. 6|5. no H. M.

Fundus examination—R. E. Vitreous opacity present. Fundus seen through a mist. Posterior lental opacity present in R. E. L. E. healthy. W. R. negative. Blood sugar normal. Urine normal. Teeth good.

A course of subconjunctival saline 2 per cent was started. After 6 weeks treatment patient's vision came to 6|9. Lental opacity almost disappeared and fundus could be seen quite clearly. Vitreous haze disappeared.

Summary

Three cases of posterior subcapsular opacity of lens following recurrent attacks of uveitis are described.

No definite ætiological factor for recurrent attacks of uveitis could be found and the author thinks that they are due to arteriolar spasm resulting in capillary dilatation and increased capillary permeability with transdudates of plasma, white cells and possibly R. B. C. The result is tissue anoxia.

In all the three cases described, vitreous haze and floating opacities were prominent features, but no K. P. were found.

The uveitis probably, therefore, was an acute choroiditis resulting in vitreous changes. The nature of the intraocular fluid was also changed from the same attack as a result of which lental changes appeared. With the idea that tissue anoxia was the cause for recurrent attacks of uveitis, attempts were made to improve the circulation by injecting sodium chloride solution 2 per cent subconjunctivally, which acted as an irritant and produced vasodilatation. Vitreous haze disappeared. Visual improvement occurred coincidentally with the absorption of exudates and clearing of vitreous.

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JOURNAL OF THE

INDIAN MEDICAL ASSOCIATION

CALCUTTA, JANUARY 1942

A. R. P.

We draw the attention of the medical profession to the resolution regarding medical men and A. R. P. work, passed at the XVIII All-India Medical Conference held at Hyderabad (Dn) in Christmas Week in December last. The resolution runs as follows:—

This Conference deplores the almost complete unpreparedness of the country to meet the impending dangers of air raid attacks that threaten the civil population at present and views with apprehension the effects that rapid evacuation without properly planned sanitary and medical arrangements, would cause. The Conference, therefore, calls upon the local bodies to make, in consultation with the members of the medical profession, such sanitary and medical arrangements as will be necessary to meet the situation and, particularly, to prevent the occurrence and spread of epidemic diseases which are likely to break out as a result of the rapid and uncontrolled influx of a large number of evacuees in the rural areas. The Conference also urges all medical organisations in the country to co-operate with the local authorities in the matter and help them in providing the necessary sanitary and medical relief measures.

We feel sure that the appeal made by the Conference to the medical profession will find ready response throughout the medical profession in India and the medical profession will rise to the occasion and render such services as are possible for them to the injured from air raids. Rangoon and some parts of Burma are being raided daily and many cities in India, particularly the east coast are now in the danger zone. It is, therefore, a welcome sign that at least in one province, namely in Bengal, the Hon'ble Minister in Charge of Public Health accompanied by the Surgeon-General, General Paton, took the medical profession into confidence and sought their co-operation. Mr. Santosh Kumar Basu has now been given the special portfolio as Civil Defence Minister for which we offer our heartiest congratulation to him. He brings with him his wide experience as a former Mayor of Calcutta, a rich store of knowledge, uncommon acuteness of judgment, a command over intricacies of civic administration, wonderful store of practical information blended with sympathy and understanding and a powerful eloquence in which few could equal or surpass him. He has foreseen by his prudence that the success of the measures which he has got to adopt for the safety of the civil population cannot be achieved unless he can get the full support and co-operation of the medical profession. As the first step in this direction he has, therefore, readily decided to appoint a Liaison Committee composed of the representatives of the Indian Medical Association and of the independent medical profession as follows:—

Dr. B. C. Roy, M.D., M.R.C.P., F.R.C.S. (Eng.), President Medical Council of India; Dr. K. S. Ray, M.A., B.SC., M.B., ch.B. (Edin.), President, Indian Medical Association; Dr. Panchanan Chatterjee, M.B., F.R.C.S., (Edin) President, Calcutta Branch, I.M.A.; Dr. Subodh Datta, M.B. (Cal.), L.M. (Rot), F.R.C.S. (Edin.), President, Bengal Provincial Branch, I.M.A.; Dr. K. K. Sen Gupta, M.A., B.SC., M.B., D.T.M., Secretary, Bengal Provincial Branch, I.M.A.; Dr. A. D. Mukharji, L.M.F., President, All India Licentiates' Medical Association.

It was brought very forcibly to him at the meeting which he presided over at Calcutta on the 27th December, 1941, that owing to the dislocation of trade and industry the medical profession along with others has also been affected very adversely. The recent massive evacuation of the civil population has hit the profession very hard and it is not very unlikely that many medical men will be forced to follow their clientele to district towns to enable them to eke out their existence. Those who are not able to leave the city are threatened with additional burden, namely with the maintenance of separate establishments one in the city, the second for the residence of their family and children in the moffussil and possibly a third for the education of their grown up children. This additional burden many can ill afford to maintain. Besides, domestic servants, cooks and chauffeurs have also evacuated in large numbers and those who have remained have to be paid higher wages.

The following suggestions were made by the Liaison Committee: Additional beds would be provided in the existing hospitals for air raid victims in addition to new hospitals being provided for the purpose. First aid centres in different localities in Calcutta will also be started. All these would require

a large number of medical personnel and we are glad to note that the Hon'ble Minister in charge was very sympathetic towards the recommendations made by the committee that medical men should be compensated in the crisis while discharging their duties. The following grades of allowance were recommended by the Liaison Committee for the consideration of the Government:—

Senior visiting officers Rs. 500 each, Junior visiting physicians and surgeons Rs. 350 each, House surgeons and physicians Rs. 140 each, Senior anæsthetists and radiologists Rs. 350 each, Residential Medical Officers in charge (one) Rs. 350. And 2 Assistant officers Rs. 150 each a month. Medical Officers full time for First aid posts Rs. 250 and part time men at Rs. 100.

The recommendations if given effect to would ensure efficiency of the organisation which is the most important thing.

In this connection we may be permitted to suggest that there should be a division of labour. The Surgeon-General who is busy with his regular duties can hardly be expected to do full justice to the grave situation which menaces the province inspite of his earnest desire to do so. Long before this is in print we trust that Government will take action for the appointment of wholetime officers on whom would devolve the question of recruitment of medical and nursing staff in the new hospitals as well as the supply of the needs and shortcomings in the expansion of the existing hospitals.

In addition, it would also be necessary to secure the service of a person who would be in charge of sanitary arrangements as this would be a grave question at the moment. As a result of bombing all communications as also supply of water are likely to be dislocated and such an emergency requires the wholetime attention of a person in authority. The question as to what sanitary and preventive measures should be taken in case of outbreak of epidemics should be given serious consideration. Owing to evacuation of the civil population from the city there has become a large influx in rural areas and in small municipal towns whose sanitary and medical needs are now subject to a great strain.

It is, therefore, not unlikely that these places will be subject to epidemics and unless preventive measures are taken in hand immediately it may not be possible to cope with it even if one is prepared to spend a large amount of money and a large personnel of sanitary medical officers in rural and municipal towns are engaged subsequently. It is necessary to draw up a scheme or plan and the machinery should be created to look into this question in all its aspects at once. The question of supply of medical requisites in mofussil requires serious consideration too.

* * * *

One is grateful to other Universities, particularly to Aligarh and the Punjab University, who have come forward to render every help and assistance and have asked for suggestions as to how they can help the Calcutta University. Not only the question of general education but also the medical education of the province is under a great menace. At the present moment most of the medical institutions are centred in Calcutta and if these are subjected to air raids one can easily visualise that the result of years of labour spent in collecting the valuable specimens and equipments with which the medical institutions are equipped may be lost and it will not be possible to replace them even long after the war. In view of this apprehension in England even before the war was declared most of the medical institutions were removed to more secure places where air raids were less likely as the authorities felt that medical education should proceed unhampered. We draw the attention of the authorities of the Universities and medical colleges to consider seriously this aspect of the question. We suggest that the Government should appoint a committee to consider the question in all its aspects at an early date.

CURRENT MEDICAL LITERATURE

MEDICINE

Cerebral Embolism in Mitral Stenosis

Harris and Levin (*Ann. Int. Med.*, 1941:15:637) in reporting on their observations on 72 cases of mitral stenosis in which cerebral embolism occurred point out that there were 26 males and 46 females, the average age was 42·7 years, there were 24 'immediate fatalities' among the entire 72 cases *i.e.*, 33 per mortality, the average period of survival of the 15 cases that died subsequently was 13·2 months. Hypertension was present in 18 cases and it had no effect on the 'immediate mortality' but the survival period of those who recovered was distinctly longer (19·7 months); heart failure and auricular fibrillation were more common in the hypertensive group. Auricular fibrillation was present in 55 cases and regular rhythm in 17 cases and among the latter there was only one male; the immediate mortality and survival period of those recovering from embolism were not influenced materially by the presence of auricular fibrillation, despite the fact that hypertension and congestive failure were more common in this group. There were 23 cases with and 49 without congestive heart failure; the former had a much greater 'immediate mortality' (53 per cent as compared to 24 per cent); in all 4 cases of congestive failure with regular rhythm 'immediate fatalities' occurred, while among 13 regular cases without failure only 4 died. The prognosis for recovery of motor function after embolism was poor; speech disturbances, however, cleared in practically all cases. The authors maintain that cerebral embolism is more likely to occur in cases of mitral stenosis that have very little objective evidence of congestive heart failure and is less apt to develop in those who are bedridden with advanced failure; cerebral embolism occurs more frequently in compensated than in decompensated cases of mitral stenosis because the former state lasts longer than the latter.

Pulmonary Infarction in Heart Disease

Hines and Hunt (*Ann. Int. Med.*, 1941:15:644) report that the survey covering 1311 necropsies performed in a six year period revealed 101 cases with gross pulmonary infarction, an incidence of 7·7 per cent. They further observe that heart disease, the principal cause of death in 234 cases was accompanied by gross pulmonary infarction 81 times (35 per cent) and yet a clinical diagnosis of pulmonary infarction was made only twice. This striking diagnostic failure prompted an analysis of the clinical symptoms and signs presented by these patients and as an aid in this diagnostic dilemma the following suggestions are made: in the management of heart disease the high incidence of this complication should be kept in mind; infarction of the lung should be considered if the patient has persistent or recurrent hæmoptysis, persistent deep cyanosis, unexplained jaundice, unexplained fever, sudden onset of heart failure not explained by over exertion or infection. Finally, critical analysis of the roentgen-ray films of proved cases may lead to the establishment of typical roentgen-ray findings for this condition.

Traumatic Asphyxia

Bonnin (*Lancet*, 1941:2:333) writes that hæmorrhages into the skin often occur in traumatic asphyxia. Two types of skin lesion are found—cyanosis and petechial hæmorrhages—and these may coexist. Petechial hæmorrhages alone have not been reported. Th cyanotic coloration fades in about 4 days with no intermediate pigmentary changes; the petechial hæmorrhages fade in about 12-14 days and undergo the characteristic color changes of a bruise. The cyanosis is due to venous stasis in overdistended capillaries, temporarily paralysed as a result of continued back pressure and to anoxæmia produced by a slow or continued squeeze of the thorax. The petechial hæmorrhages are due to a sudden wave of back pressure in the veins producing capillary rupture, resulting from a sudden blow on the thorax. If the sudden force on the thorax is not relaxed then the continued pressure may produce cyanosis as well. In the absence of severe associated injury the prognosis is good, 90 per cent. of cases recovering. There is no treatment, other than of the complications of associated injuries.

Renal Complications of Sulphapyridine Therapy

Laird (*Lancet*, 1941:2:272) writes that hæmaturia is now recognised as an important complication of sulphapyridine therapy and presents the clinical picture in three stages with illustrative cases. In the first stage hæmaturia is only detected microscopically and pain is sometimes present; in the second stage the hæmaturia is gross, usually accompanied by pain but clears up rapidly on withdrawing the drug and giving ample fluids; and in the third stage, despite such remedial measures there is impairment of renal function, leading to nitrogen retention, anuria and death. It is suggested that crystals of acetyl-sulphapyridine deposited in the renal tubules, pelves and ureters produce bleeding, œdema and possibly reflex spasm which may in severe cases lead to ureteric obstruction, hydronephrosis and failure of renal function. The author mentions amongst others the following as factors influencing the precipitation of the crystals: intensity of dosage, rate of absorption and excretion, the proportion of free and conjugated sulphapyridine in the blood and urine, the amount of fluid intake and loss, and the concentration and reaction of the urine.

In prophylaxis the most important measure is to ensure a daily fluid intake, not less than 3,000 c.cm. The complication should be recognised early, for in the first and second stages treatment is simple and highly effective. In the third stage a favourable prognosis depends on the institution without delay of ureteric catheterisation and lavage.

Digitalis Preparations Compared

Evans (*Brit. Heart J.*, 1940:2:51) reports on the comparative value of six commonly used preparations of digitalis, basing on his observation on 18 patients with heart failure caused by rheumatic heart disease with mitral stenosis and auricular fibrillation. Each preparation was given for 14 days in doses reckoned equivalent on the basis of biological assay and at the end of each fourteen-day period the heart rate and

severity of symptoms and signs were estimated. The satisfactory control of symptoms combined with absence of toxic effects and decrease in heart rate was obtained with all the six preparations which in the order of efficiency of the doses used were: powdered digitalis leaf, digitaline (Nativelle), digifoline (Ciba), digoxin (B. & W.), tincture of digitalis and digitaline (Allen & Hanbury). A trial was also made of 3 other drugs which have a digitalis-like action and which have been vaunted in the continent and America as being equal or superior to digitalis itself. These three drugs folinerin, derived from the oleander tree, strophanthine and ouabain (a strophanthin glucoside), not only proved unsatisfactory but often caused toxic symptoms. Finally coramine and cardiazol—cardiac stimulants were tried and they were without avail in control of symptoms and had to be replaced by digitalis after seven days. These drugs also produced toxic symptoms.

Indications for Quinidine and Digitalis

Asher (*M. Times*, 1941:69:287) writes that therapeutic indications for digitalis are: (1) congestive heart failure without bradycardia, (2) auricular fibrillation or flutter with rapid ventricular rate to increase A-V block, (3) therapeutic test in impending failure in cardiac overstrain, such as hypertension of chronic valvular disease, and contraindications are: (1) high grade heart block with Adams-Stokes' syndrome, (2) hypersensitivity with previous digitalis poisoning, (3) neurocirculatory asthenia and collapse after severe infection and anæsthesia, (4) to slow the heart in toxic hyperthyroidism. He mentions the following as therapeutic indications for quinidine, *viz.*, (1) auricular fibrillation in young hearts without congestive failure to regularize after thyroidectomy, (2) multiple premature contractions where hyperirritability is known and toxic factor removed, (3) auricular flutter immediately following digitalization, (4) occasional paroxysmal tychycardia after digitalization has failed, (5) ventricular tachycardia (6) in coronary thrombosis, in the hope of lessening myocardial irritability, prophylactic against ventricular tachycardia and fibrillation. Contrandications to quinidine are (1) congestive heart failure since quinidine has a depressant effect on the myocardium, (2) quinidine sensitivity, (3) in known depression of respiratory centre. Indications for simultaneous administration of digitalis and quinidine are: where an increase of A-V block and a depression of metabolism also are desired, such as thyroid crisis with auricular flutter or fibrillation and rapid ventricular response with congestive failure (consecutive trials are frequently justified), but in all other conditions the simultaneous administration is to be avoided. In auricular disease with circus movement digitalis is useful because it increases the A-V block and preserves the ventricle where quinidine exerts opposite effect. Digitalis is thus the drug of choice for increasing A-V block and improving muscle metabolism and quinidine is used to depress muscle metabolism.

SURGERY

Serum Treatment of Peritonitis

Bohmansson and Norup (*Acta chir. scand.*, 1941:41:427, *Ref. Lancet*, 1941:2:288) report successful results obtained by 'antiperitonitis serum' in cases of acute peritonitis, specially peritonitis complicating appendicitis. The serum used contained antibodies to the two main types of organisms that were considered pathognomic—the different varieties of bacillus coli and Clostridium welchii. Dosage is all important as only good results have been obtained with massive dosage. The series reported shows that in the first period in which no serum was used the fatality was 42 per cent., with small dosage of serum it was 50 per cent., in the third period, comprising the last two years the dosage was much increased and a fall to 6·3 per cent. was obtained. The dose now used is 60 c.cm. intraperitoneally and 40 c.cm. intravenously at the time of operation with smaller doses intramuscularly during the next few days. They operate on all cases of peritonitis that they consider fit to stand laparotomy. They remove the inflammatory exudate and any grossly infected material but do not wash out the peritoneal cavity. They make a rule of closing the abdomen without drainage except where there is a localized area of infection which obviously requires a drain. Spinal anæsthesia is used, counteracting fall of blood pressure with intravenous fluids during operation. The main points of their after-treatment are intravenous fluid, warmth to abdomen, inhalations of oxygen and small repeated doses of morphia. They allow no aperient, no enemata and no rectal washouts. As early as possible, usually about the second or third day they get the patient up and let him sit on the closet and have his first motion nautrally.

Postoperative Complications of Pulmonary Lobectomy: A Clinical and Experimental Study

Gower (*Brit. J. Surg.*, 1941:29:3) mentions the following as post operative complications of lobectomy, *viz.*, (1) shock usually proportional to the extent and vascularity of the adhesions required to be separated on, (2) reactionary hæmorrhage from adhesions and more rarely from hilar stump, (3) tension pneumothorax owing to the early develepoment of a valvular bronchial fistula, (4) embolic phenomenon caused by damage to a branch of the pulmonary vein leading to the aspiration of air of infective material into the left auricle causing hemiplegia and subsequently cerebral abscess, (5) intracardiac thrombosis due to a spreading thrombosis from the ligated pulmonary veins, (6) massive collapse of the remaining lobe, (7) bronchopneumonia occurring in cases where bronchiectatic areas of the lung remain after the operation, (8) infection occurring in the hilar stump, in the chest wall or in the mediastinum, (9) pericarditis associated with sepsis in the pleura by direct or lymphatic spread, and (10) spread of bronchiectasis.

The risks attending lobectomy might be reduced by (1) allowing a prolonged period of postural drainage before operation in order to reduce the quantity of sputum present, (2) encouraging the elimination of neohydriol after bronchiography, and if there is much x-ray evidence of retention allowing an interval of at least two months between bronchiography and lobectomy, (3) operating only with the lobe adherent to the chest wall and, if necessary, performing a preliminary pleural pondrage to effect this, (4) using the spinal anæsthesia (5) keeping provision for an adequate drainage tube and exercising great care to see that it does not become blocked. (6) encourage-

ment of postural drainage of the upper lobe by placing the patient in semi-sitting position as soon as possible after operation and (7) encouragement of re-expansion of the upper lobe by means of breathing exercises and possibly by intermittent inhalation of carbon dioxide and oxygen.

Acute Gall Bladder

Best (*Surg. Gynec & Obst.*, 1941:73:312) gives in the following lines the summary of his observations:—

1. The incidence of gangrene, abscess and perforation in acute cholecystitis is between 10 and 30 per cent and as in appendicitis the mortalities are mostly in this group. By approaching the case with a surgical attitude and deferring operation only when there is no confusion of signs, symptoms, laboratory findings and appearance of the patient, the mortality for acute cholecystitis may be reduced.

2. The incidence of gangrene, abscess and perforation is higher in the older age group, beginning with 50 years and specially after 60 and this group of cases carries the higher mortality rate. One should approach this group with a more definite surgical attitude.

3. In group 2 of my own series, in which all patients were approached with a definite attitude, 72·8 per cent were operated upon early and only 13·6 per cent of the patients had advanced gangrene, abscess or perforation. Only 1 death occurred in this group. In retrospect, in some of the patients operated upon, the conditions might have subsided after 1 or 2 more days of observation. Probably about 50 per cent of cases of acute cholecystitis in any series should come to operation to give the lowest mortality for acute cholecystitis, but again it must be emphasized that any confusion of signs, symptoms, laboratory findings, including the haziness of the upper quadrant in the flat x-ray plate, indicates a need for operation.

4. If the differential count reveals staff forms above 10 per cent., one should be suspicious of nonsubsiding acute cholecystitis. In this group of cases, this was a fairly constant finding but not infallible.

5. As to appearance, a "stationary loginess or apathy", particularly in the older group, seemed to be a characteristic of nonsubsiding acute cholecystitis.

6. About 90 per cent of patient with acute cholecystitis have associated gall stones and about 20 per cent. of these will have stones in the common duct. If the acute inflammatory reaction will subside, there is later a better opportunity to explore the common duct.

7. Probably it is safer to favour early operation and operate only upon about 50 per cent. of the patients than to favour conservative treatment and operate only after advanced complications have arisen. In 2 groups of 22 patients each, the group mortality was reduced from 13·6 to 4·5 per cent by favouring early operation in about 70 per cent. of the second group.

8. Delayed cholangiography when possible and the routine biliary flush are most important in the management of these cases.

Cyclopropane Anaesthesia in Military Surgery

Kellogg and others (*Mil. Surgeon*, 1941:89:177) basing on six years experience with cyclopropane anæsthesia involving more than 8,000 cases write that the gas is of greater value than any of the new inhalation agents. Its advantages are: (1) smooth and speedy induction, (2) complete relaxation can be obtained, (3) a small amount will suffice for many anæsthesias, (4) respirations are very quiet under full anæsthesia, (5) it may be given with a high concentration of oxygen, (6) depth of respiratory excursion may be controlled, thus making this gas the ideal anæsthetic for lung surgery. Its disadvantages are: (1) it is explosive in anæsthetic concentration, (2) there is somewhat more bleeding under C_3H_6 than under other agents, (3) the patient passes from plane to plane of anæsthesia quickly, (4) there is danger of respiratory paralysis when full relaxation has been obtained and (5) postoperatively one frequently finds a condition which we call "cyclo-shock." The authors give below the summary of their observations: 1. Cyclopropane is an anæsthetic agent of value and should be used generally more than it is at present. 2. "Cyclo-shock" which is a postoperative collapse, is a condition which must be watched for and treated adequately before it occurs, if possible. 3. Color is of no import in estimating cyclopropane anæsthesia depth—the three important signs are (*a*) breathing, (*b*) pulse and (*c*) relaxation. 4. Cyclopropane may be used in all ages. 5. See that the mask is firmly adjusted before introducing cyclopropane into the closed system—always use the CO_2 absorber, but remember that there may be times during anæsthesia when it is advisable to let the patient have his carbon dioxide. 6. Every case of cyclopropane anæsthesia must be treated as an entity. 7. Apnœa is not dangerous, in fact it must be obtained in certain types of surgery—control it by passive respiration until the patient responds with active breathing. 8. Shut off the cyclopropane when the operation is nearing a close: introduce nitrous oxide, CO_2, air or helium at the termination of surgery. 9. A pulse below 50 is a danger signal and it indicates immediate action in giving oxygen, forcibly if necessary. 10. In giving passive respiration with an endotracheal tube in place, remember that it is possible to do damage to the alveoli of the lungs, which are no longer protected by the vocal cords. 11. Arrhythmias of cardiac origin are not serious, but only temporary—occasional tachycardia, extrasystoles, *et al*, are of frequent occurrence. 12. Do not allow cyclopropane to be used when electrical instruments such as cautery, diathermy and surgical knife are required—remember that at least 65 per cent of all anæsthetic explosions have been due to the human element.

OBSTETRICS AND GYNAECOLOGY

Fœtal Mortality in Post Maturity

Clayton (*J. Obst. & Gynæc. Brit. Emp.*, 1941:48:450) from a study of 9,649 consecutive labours observes that the fœtal mortality among patients in whom pregnancy was prolonged was found to be higher than the ordinary fœtal mortality. Evidence of placental insufficiency could not be discovered. The fœtal deaths in patients with prolonged gestation were found to be due to congenital abnormalities (13 per cent), disproportion and malpresentation (30 per cent.) and primary uterine inertia (30 per cent). In all but two cases some definite cause of death was found other than postmaturity *per se*.

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The frequency with which uterine inertia occurs in postmature cases (8·4 per cent) is shown to be higher than among normal cases and the bearing of this on the treatment is discussed.

Localization of the Placental Site by Tomography

Lloyd and Samuel (*J. Obst. & Gynæc. Brit. Emp.*, 1941:48:499) describe a radiological method of localizing the site of the placenta and report results of 5 cases so recorded. The radiographic technique is as follows: The patient is placed in supine position and the pelvis is raised by wool bags to bring the long axis of the uterus parallel to the film. An estimation of the midpoint of the uterus is made and a tomographic film taken in the long axis of this plane. A film using a similar plane is made with the patient lying in the left lateral postion. In cases in which difficulty is ecountered in estimating the mid plane of the uterus two films can be taken at 1 inch apart on either side of the mid plane in the supine and latral positions. Exposures recommended are 60 kv., 60 ma., 3½ feet, 5 seconds. The uterine wall appears as a smooth line slightly darker than the blurred gas-filled abdominal cavity and the relatively radio-trensluscent liquor amnii. The placenta appears as a definite smooth ovoid swelling encroaching on the uterine cavity and of the same density as the underlying uterine wall. The demonstrations of the placenta on the central part of the lower segment can be done by this method but it involves more technical difficulties. Moreover, the absence of the placenta from the upper segment and the lateral walls of the lower segment is of definite value as a central placenta paravia can then be diagnosed with some confidence.

Comparative Analysis of Total Abdominal, Supravaginal and Vaginal Hysterectomies

Miller and Prejean (*Am. J. Obst. & Gynec.*, 1941:42:580) give in the following lines the summary of their observations: 1. Hysterectomy, regardless of the type is a comparatively safe surgical procedure when done by the trained specialist. 2. Total hysterectomy is the preferable type of transabdominal approach, because with the removal of the cervix such post operative sequelæ as leucorrhœa and chronic foci of infection are eliminated. The mortality in the group of total hysterectomies studied was lower and the morbidity rate was only slightly higher than those of the subtotal group. 3. Subtotal hysterectomy should be the procedure of election if the pathology is extensive and necessitates a tedious and time-consuming operative procedure or if the experience of the surgeon is limited. 4. Vaginal hysterctomy deserves its position of popularity because of its relative safety, the fact that there is less post operative shock and distention and because of the excellent end results obtained. The authors feel that such results are obtained only when the conditions previously mentioned are present which render the technique of vaginal hysterectomy comparatively simple.

Anoxia in New Born Infants

Mcphail and Hall (*Am. J. Obst. & Gynec.*, 1941:42:686) point out that abnormal delivery, prematurity, early rupture of the membranes, outlet forceps, maternal anæmia, long second stage, rapid labour and the use of analgesic drugs are important factors in the production of neonatal apnœa. The incidence of this neonatal apnœa may be reduced by the prevention of anæmia and dehydration, by restricting operative procedures to absolute indications, by preserving the membranes if possible, by using small amount of analgesic drugs, by supplementing light anæsthesia with local anæesthesia and by liberal use of oxygen.

Carcinoma of the Uterus

Macleod (*Post-Grad. M. J.*, 1941:17:140) in dealing with the treatment of the condition writes that the greatest scope for radium lies in cases where operative measures present difficulties and dangers and as radium tchnique improves this scope will tend to increase; *pari passu* with this, a diminution in the scope for operative treatment may be expected but so long as irradiation remains ineffective in dealing with lymph node secondaries, operation will remain the treatment of choice in certain cases, the problem being to know where to draw the line of demarcation between the two methods. Comparing statistics obtained from the recent Annual Report of the National Radium Trust and Commission giving the aggregate figures from sixteen centres all over the world, with figures for Wertheim's operation as given by Victor Bonney, taken to represent the best results that can be expected, there does not seem to be any important difference in the results obtained by the two methods. At the same time, it must be appreciated that Victor Bonney only treated 63 per cent. of all cases seen between 1907 and 1929, and that many of the remainder would be regarded now-a-days as suitable for radium treatment, giving a much enhanced figure for total five year cure by both methods. The figures of the Radium Commission, however, refer to radium treatment for over 87 per cent of all cases seen in recent years. It should be remembered that Victor Bonney's mortality of 14 per cent. compares with a radium mortality of 2 per cent. or under, and yet the results are approximately the same. A judicious employment and selection of both methods should yield even better results than those obtained upto the present moment. The author gives below the clinical grouping of cases of carcinoma of the cervix (as recommended by the League of Nations) which will be of great help in diagnosis and hence in treatment. Group I consists of cases where the growth has extended on to the cervix and where there is no limitation of movement. Group II consists of cases where the growth has extended on to the vaginal vault or where there is some infiltration of one or both parametria but it has not invaded the pelvic wall and fixation of the cervix is not complete or where there is some extension to the body in the case of endocervical carcinoma. Group III consists of cases where there is compelete infiltration of one or both parametria or where it has involved the pelvic wall resulting in complete fixation of the cervix or where the pelvic lymph nodes are involved or where the lower third of the vagina is involved. Group IV consists of cases where the bladder or rectum is involved or where the carcinoma has extended to the vaginal vault or where there are distant metastases. It is to be realised that this grouping is only a clinical one and has no pathological foundation as many cases which appear clinically in Group I will at operation be found to have metastases in the lymph nodes and therefore, will fall into Group III.

PEDIATRICS

Pulse Rate in Juvenile Rheumatism

Glazebrook and Thomson (*Edinburgh M. J.*, 1941:48:619) observe that a pulse depression is found to be a common feature of the first attack of rheumatism in adolescents and young men, that it occurs at an early stage and is often of a transient nature, that recognition of this sign may aid diagnosis, and it appears to afford an index of severity of the toxæmia. It is associated with a marked sinus arrhythmia and sometimes progressed into a temporary partial heart block. A similar depression was seen in sreptococcal infections which are possibly closely allied to the rheumatic state. The prognostic significance of a pulse depression as regards permanent cardiac damage was considered to be bad.

Treatment of Dehydration

Kerpel-Fronius (*Orvosi hetil*, 1940:84:15. *Ref. Am. J. Dis. Child*, 1941:62:636) writes that dehydration may be divided into two types: (1) simple water deficiency and (2) water deficiency combined with salt deficiency and one cannot correct the second type by giving plain water or solutions of dextrose because if only a small amount of water is given it runs through the organism and if much is given 'water poisoning' occurs as a result of the lowering of the osmotic pressure. The most clear cut type of dehydration with salt deficiency is that which occurs after prolonged vomiting. In such cases administration of physiologic solution of sodium chloride has proved quite effective. If the chlorine content of the blood serum is very high it is advisable to add sodium bicarbonate to physiologic solution of sodium chloride to avoid acidosis. When the dehydration is too great the plasma exudes from the blood vessels; in such cases transfusion of blood or plasma should be given. If dehydration is very severe one can expect success only from the use of intravenous infusions, because the solutions given by hypodermoclysis or intraperitoneally are not completely absorbed.

Polyps of Rectum and Colon in Infants and Children

Kennedy (*Am. J. Dis. Child.*, 1941:62:481) writes that bleeding from the rectum is far the most common symptom in cases of 49 infants and children who had polyps of the rectum, the colon or both. The polyps are visualised by proctoscopic and rœntgenologic methods. Treatment is by surgical methods or by removal or destruction of the polyps by means of the proctoscope. Some of the lesions were frankly carcinomatous. All adenomatous polyps, except those found in certain cases of chronic ulcerative colitis, have carcinomatous potentialities and should, therefore, be removed or destroyed.

Sulphanilamide for Otitis Media

Braun and Bigler (*Am. J. Dis. Child.*, 1941:62:521) from a statistical report of the results of treatment of 425 patients with acute oitis media (or which 222 were treated with sulphanilamide and 203 as controls) observe that the total period of illness and the duration of otorrhœa were decreased and that the incidence of otorrhœa, myringotomy and complications requiring surgical care were materially reduced by the use of the drug. The authors maintain that sulphanilamide therapy, under careful supervision, should be tried in all cases of acute otitis media and the drug should be given early in the course of the disease, in adequate dosage and over a sufficiently long period to ensure against a recurrence of symptom when it is discontinued.

Treatment of Haemorrhagic Disease of the Newborn

Macpherson (*Brit. M. J.*, 1941:2:433) writes that the prompt and maintained increase in the plasma prothrombin and the rapid control of hæmorrhage (within two hours of administration where bleeding was superficial) after the injection of vitamin K analogues are manifestly quite independent of any coexistent tendency to spontaneous recovery. The site of injection (intramuscular or intravenous) has no effect on the rapidity of the action and there is no material difference between oil soluble and water soluble preparations. The simplicity of this method and the extreme rarity of condition in which vitamin K analogue will not be effective in arresting the hæmorrhagic tendency suggest that one of them should be employed first in all cases of spontaneous and persistent bleeding in the newborn. It is probable that in most severe cases in which prolonged and massive hæmorrhage is exsanguinating the patient, simultaneous treatment by transfusion and injection of vitamin K analogue should be given. The rapid action of the transfusion in elevating the hæmoglobin and plasma prothrombin level would thus be reinforced by the slightly slower and much more sustained effect of vitamin K analogue on the clotting activity of the blood.

Successful Treatment of Noma with Solution of Formaldehyde

McMillen (*Am. J. Dis. Child.*, 1941:62:590) writes that the daily application of the solution of formaldehyde is highly efficacious in cases of advanced noma. In one case reported in 1935 and in six consecutive cases reported in the present paper such treatment was used without a death (the mortality rate was previously 90 per cent). Neither sulphanilamide nor sulphapyridine proved useful. A mouth-wash is not only unnecessary but may even do harm by washing away the formaldehyde. The author gives below the following points to be borne in mind in treatment of the condition:

1. Excision should be confined to large neglected ulcers; even then it should not cause bleeding or pain; no attempt should be made to excise all of the infected tissue because this procedure is harmful; hanging shreds of tissue and loose teeth may be removed.

2. The lungs can usually be protected against the irritating vapour of formaldehyde; cotton can be pushed into the back of the mouth when one is applying the solution in the mouth and into each nostril if one is swabbing the nasal area.

3. It is important to dry the ulcer with cotton before applying the solution of formaldehyde.

4. The application should have a generous wad of loose cotton on the end and should be well saturated with the undiluted solution of formaldehyde but not dripping; care should be exercised so that any excess of the solution does not run back into the pharynx.

5. Applications should be made once daily until there is no sign of further extension and the ulcer has become dry and free from stench; about four or five applications are necessary.

HYGIENE AND PUBLIC HEALTH IN ANCIENT INDIA

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The Hindus of ancient India appear to have a fairly well-developed sense of hygiene and public health. Although microbic origin of disease was not known to them, yet they were conscious about communicability of diseases. To them all diseases were preventible. Pundits versed in Atharvaveda said "there are hundred and one kinds of death of which only one is natural and the rest are unnatural or preventible" (Susruta, *sutra*, Ch. 34, 5). Again "Ayurveda is for curing disease as well as for preserving the health of healthy people" (*Ibid.*, Ch. 1, 12). A man's life was so regulated in Ayurveda to keep himself healthy that even to this day one may follow those rules with profit. Air, water, food and other necessary articles received proper attention. In fact, there is scarcely a thing in the whole biological and mineral kingdom which failed to receive due attention. Nature, season, climate, heat and cold, atmosphere and altitude had also their share of attention. Everything that man came in contact with, and which had a chance of reaction on his life, was observed, examined and considered in its various aspects and tried to be utilised for the benefit of man's physical and moral self. In ancient literature and custom, many of which are prevalent even to this day, although their significance is not properly understood, we find plenty of efforts in preventing diseases from spreading and in keeping men free from them.

In Chapter 24 of Sutrasthanam, Susrutasanhita as well as in chapter 5 of Sutrasthanam, Charakasanhita are described in detail "the routine to be followed daily by a wise healthy man who wants to live a disease-free life" and "how disease which has not come can be prevented". I would quote a few items only to show how they compared favourably with our modern conception.

"You should brush your teeth after getting up in the morning".

"Mouth should be gargled . . . Eyes should be washed."

"Rub oil over your head and body, take daily bath, comb your hair, take wholesome food, rest and moderate exercise; sleep on a soft, clean bed in well-ventilated room. Keep your hairs, nails and skin clean. Do not walk bare-footed or with uncovered head. Use footwear and umbrella and head dress. Nails and hairs should not be allowed to grow long. Always keep clean, wear clean clothes and speak moderately. Do not sit on your feet or on a small hard stool. Do not restrain call of nature, scratch the ground with your nail, light a fire by blowing with your mouth, keep your neck bending or do a work or eat while bending your body sideways. Do not look with your eyes wide open at any light, the sun, a minute article or a revolving thing. Do not carry a weight on your head or overdo any of the following even if you are used to them—sleeping, walking, sitting, riding, jumping, swimming, laughing, speaking and exercise. When you are hungry, eat wholesome food examined by a physician, in a moderate quantity. Do not partake of a feast arranged by the villagers, nor take any food offered by a prostitute or from a hotel. Avoid all foul food. Do not take food served by many men or fouled by flies. Do not eat without washing your hands and feet. Do not let the time of your meal pass by. Do not eat more nor less."

"Do not wear footwears, ornaments and old clothes used by others."

"Do not drink water, or if at all use it sparingly, during the rainy season."

"Do not have any connection with a woman who is dirty or has venereal disease."

Since "man is the great source and reservoir of human infection" (Rosenau) the ancient sages tried to keep every individual in perfect condition so that there could be no question of infection spreading.

Conception of food too do not compare unfavourably to the modern one. "Food is the source of growth, strength and health.....it is the source of ill-health as well when injudiciously taken (Susruta, *sutra*, Ch. 46, 2). Compare Rosenau "Diet may make or mar public health", and "vigor and success of a nation rest fundamentally upon its diet." "A physician who is ignorant of the properties of food is unable to keep the health (of people) fit and to prevent disease (Susruta, *sutra*, 46, 3). In chapter 20 is described in detail what to eat and how to eat to keep oneself fit, wholesome and injurious combination of different articles of food, how different preparations change their nature. It has also been stated that some food is wholesome for all, some for none, and others beneficial to some but injurious to others according to the nature of their constitution. And so thorough was their study of the subject that, though not given in terms of caloric or vitamin value, every article of food was examined from different angles with regard to its properties and applicability on different constitutions and in different conditions. What a volume of work was done on the subject can be gauged from the fact that 30 varieties of water, 32 of milk, cream and butter-milk, 7 of curds, 52 of ghee and oil, 17 of honey, 17 of sugar, 45 of wine, 48 of cereals, 88 of meat and fish, 76 of fruits, 125 of vegetables and 14 of salts, besides others have been thus described, with instructions as to how and when to take them and what to reject (Susruta, *sutra*, 45, 46; Charak, *sutra* 27).

In Susruta, Swasthabritta is described in detail how a man should live in different seasons to keep himself healthy.

After dealing with water from different sources it is said, "one who drinks water polluted by warms, excreta, eggs and carcasses, or covered by vegetations, or drinks and bathes in flood water of the rainy season, suffers from skin diseases and intestinal and other internal diseases (*Ibid.*, *sutra* 45, 6). "Water which is covered by weeds, mud, lotus leaves etc. and over which rays of sun and moon do not fall, should be considered as polluted or diseased" (*Ibid.* 7).

"Polluted water should be purified by boiling, heating in sun's ray, dipping red-hot iron ball, sand or stone in it" (*Ibid.* 10). "Always avoid polluted water....." (*Ibid.* 11).

"Water can be filtered in 7 days" (*Ibid.* 12). Here several articles are named which when dipped in water cause the impurities to settle down.

Of air it is said "Know the air as God, for it is omnipresent, independent and life of all things, movable and immovable." (Susruta, Nidanasthanam 1, 3). Fresh air increases longevity." (*Ibid.*, Chikitsa 24, 62).

Measures against adulteration of food and other articles can be found in Manusanhita and other books. "Do not sell an article mixing another article with it, or an inferior article as a good one. Any one who does so shall be punished." (Monu, 8, 203). "In case of adulteration of medicine, ghee, oil, salt, scent paddy, sugar etc. the culprit shall be fined sixteen pans": again "if one sells as genuine a spurious article he shall be fined double the price of the article". (Jajnabalka Samhita quoted by Rai Bahadur Chunilal Bose in his Khadya).

"Housing condition may be taken as a good index of general sanitary condition and hygienic habits of the occupants" (Rosenau). We see a glimpse of it in Harappa. "Another discovery at Harappa is what may be called 'the Workmen's quarters' giving distinct evidence of careful planning far ahead of contemporary attempts. Fourteen small houses built in two blocks of seven houses each, separated by a long narrow lane, with a similar lane at either end have so far been brought to light. The three lanes are regularly intersected by a series of six cross-lanes, having the effect of making each dwelling open on all sides" (Report on Excavation at Harappa by the Archeological Survey of India).

A rough idea may also be made from the few instructions mentioned in literature. "A labour room should be 12 ft. by 6 ft., south or east facing, should have its floor clean and furniture well-arranged". (Susruta, Sarirasthanam 10, 3). This together with the conception of ventilation and light certainly gives an idea of the standard reached.

Epidemics—"Men differ in their ages, character, etc., but there are other factors which are equal, and disturbance in these latter causes epidemics and destruction of the country, for in a country such things are common to all, *viz.*, water, place and time (season).....so by contact and by drinking and eating destruction of the country (by epidemics) occurs.

"By application of proper remedies one can remain free from diseases caused by pollution of water, air etc." (Charak, Biman, 3).

"Do not stay long in a village where many men are suffering from serious diseases". (Monu 4, 60). Susruta, according to whom "epidemic occurs when the character of season changes and medicine (herb) and water become impure", also advises people to "leave the country during epidemics". (*sutra*, 6, 17). "Sometimes when smell of poisoned flowers is carried by wind to a country, people become afflicted by cough, asthma, vomiting, headache and fever (*cf.* Hay Fever)". Under such circumstances Susruta advises people to leave that place (*Ibid.*) He also forbids people to go to a place where an epidemic is raging. (Chikitsa, 24).

It is curious that it did not strike the ancient sages that people running away from an epidemic area are likely to spread the disease to other parts of the country, since there did not seem to have any arrangement for placing these people under quarantine. But at the same time various instructions may be found both in literature and custom to prevent diseases from spreading.

"Commit no nuisance inside a village or a town, a temple, a cremation ground on a road, in a tank, on the wayside.... Do not eructate, heave a sigh or sneeze without covering your mouth with the hand or something else." (Susruta, Chikitsa, 24). "Do not throw urine, stool or sputum in water, or wash clothes soiled by urine or stool in it; or throw blood, or any poison in water." (Monu, 4, 56). "Throw urine, stool etc. at least one arrow distant from the kitchen". (*Ibid.*, 151).

Quarantine was perhaps more vigorously observed than other measures, and we have inherited some of it and observe those rules though without understanding their proper significance. When one dies the rest of the family and its near relations are to observe certain restrictions for a definite period, 11 to 30 days, during which they are not to be shaved or send their clothes to the washerman, mix or dine with any member of the public, who also in their turn are forbidden to mix or dine at the house of the deceased during the said period (Monu 4, 217). After the prescribed period is over all the members of the family should have themselves clean shaved, have a full bath before he is allowed to touch any member of the public; every article of the house should be washed, wooden furniture should be scrapped. (*Ibid.* 115). After this through cleaning at the end of the quarantine period they are allowed to dine with the public, and who would take food from them. During this period of *asouch*, uncleanliness, one is forbidden to give alms even to the beggar. Even in these days the Hindus who are proverbially charitable, do not give alms to the beggar when there is an illness in their house, lest the disease spread through alms. Two kinds of *asouch* are observed, *viz.*, one after death, the other after birth. It may be asked "why the Moronasouch should be taken as quarantine of public health when there is an *asouch* of birth as well? With respect to these asouches Monu says 'Untouchability in the case of *moronasouch* is equal for all members, while in the case of *jananasouch* the father and the mother only become untouchable; the mother remains so for 10 days but the father becomes touchable after a bath". (Chap. 5, 62). The intention probably was to protect the mother from sepsis carried by other people. For in Susruta we find an incling of asepsis in the following: "four elderly women who are expert midwives and who have their nails clipped short should be in the labour room" (Sarira, 10, 6).

MEDICAL HISTORY IN THE UNIVERSITIES AND MEDICAL COLLEGES IN INDIA

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V. MEDICAL HISTORY IN THE MEDICAL COLLEGES OF UNITED STATES AND CANADA

In the previous issue I reviewed the position of medical history in the universities of Europe and now propose to briefly indicate the position in the United States and Canada, taking as my authorities the valuable papers of Professor Sigerist. Here is the result of his survey of the Medical Colleges of the United States:

"It was surprising to learn that 54 of 77 schools, or 70 per cent, provide some kind of instruction in medical history. Forty-six schools, or 60 per cent, have regular courses; the others have incidental lectures or emphasize medical history throughout the curriculum.

"Only 23 schools, or 30 per cent have no regular instruction. Of these, 3 (Howard, Buffalo, Duke) gave regular courses until recently but had to discontinue them for various circumstances. Many of the other schools try to interest their students in the history of medicine. Alabama "encourages collateral reading in medical history in every possible way"; and so do North Dakota and Dartmouth where occasional lectures are given. Iowa has no special teaching but has a Medical History Club consisting of faculty members who meet once a month. At Tufts College Dr. Benjamin Spector organizes every year a medico-historical pageant with his students which proves to be very stimulating. Standford has no regular instruction, but two faculty members (Dr. F. D. Reichert and Dr. William Dock) devote their time to any student interested in the subject and take advantage of the splendid opportunities of the Lane Medical Library.

"It is very significant that in several schools where faculties had no courses to offer (Tulane, New York University, Cornell, Harvard) students with the help of some younger instructors organized very successful study groups which meet regularly for the discussion of problems of medical history. This is a very sound development."

* * * *

"The courses given in the 46 schools are as a rule lecture courses, of from 8 to 30 hours. They are required in 28 schools (61 per cent of the 46 schools), elective in 18 schools (39 per cent). Students are examined in medical history in 22 schools. In 5 schools they are examined incidentally. In one school examination is optional."

"Seven schools report that instruction is given by "Professors of the History of Medicine" (Georgetown, Johns Hopkins, Maryland, Cincinnati, Pennsylvania, Temple, Medical College of Virginia). This is somewhat misleading. As a matter of fact, only one school (Johns Hopkins) has a full-time chair with a fully salaried professor. In the six other schools the chairs are honorary with no stipend attached to them. In all other schools medical history is taught not by specialists, but by faculty members who happen to have knowledge and interest in the subject."

"Seventeen schools have a Medical History Club. Twenty-one schools have no club of their own but there is such an organization in the community to which, as a rule, many faculty members belong. Such a club can undoubtedly fulfil a very important function particularly where instruction in medical history is not yet organized. It becomes a meeting ground for all persons interested in the subject (faculty members, students and often also physicians of the community). Papers are presented and discussed and many important contributions have come from such club activities."

Professor Sigerist concludes that the interest in medical history has increased tremendously and that the educational value of the subject has been recognized by the great majority of schools. Medical educationists are fully aware of the inadequacy of many provisions and forty-two Deans reported that they were definitely not satisfied with the teaching of medical history in their schools. Not only the intellectual leaders of American medicine but also the medical students are convinced of the intrinsic value of medical history. The Association of Medical students has for one of its objects, the study of history of medicine.

* * * *

The existing conditions can best be appreciated by the perusal of the following extracts:

(*i*) *The Johns Hopkins University School of Medicine, Baltimore, Maryland.*

Course: 12 to 14 elective lecture and seminar courses annually to pre-medical students, medical students of all courses, students of School of Hygiene and Public Health, and students of School of Higher Studies in the Philosophical Faculty. Introductory and advanced courses in medical history, courses in sociology of medicine and medical economics. Candidates are admitted for M.A. and Ph.D. in the History of Medicine and for D.P.H. in the Medical Economics.

Lecturer: Henry E. Sigerist, William H. Welch Professor of the History of Medicine and Director of the Institute of the History of Medicine. John Rathbone Oliver, Associate the History of Medicine. Sanford V. Larkey, Lecturer in the History of Medicine. Edward H. Hume, Lecturer in the History of Medicine.

Library: The Institute of the History of Medicine organized in 1929, is fully equipped for research in medical history.

Club: The Johns Hopkins Medical History Club (Constituent Society of A.A.H.M.) organized in 1890, meets 3 to 4 times a year. The Science and Social Relations Club, a student organization meets on 2 evenings every month.

Various: About the teaching programme of the Institute of the History of Medicine see the various volumes of the Bulletin of the History of Medicine.

(*ii*) *Yale University School of Medicine, New Haven, Connecticut.*

Course: No formal lectures in the history of medicine. There is a seminar in the History of Physiology and the Medical

Sciences which is elective and meets one hour per week in the fall and winter terms. It is open to all classes, is attended more by graduate students and the Physiology staff than medical students. No examination.

Lecturer: John F. Fulton, Sterling Professor of Physiology; Harvey Cushing, Director of Studies in the History of Medicine.

Library: Some, Private collection of Dr. Fulton and Dr. Cushing.

Club: Nathan Smith Club, composed of students and Faculty, meets once a month in the evening at the home of a member of the faculty. Beaumont Club, not officially connected with the Yale School of Medicine. Five meetings a year.

Various: Problem of teaching medical history not adequately solved. Do not believe that a course in medical history should be given, but that each department should touch on the historical aspects of the subject as the course progresses.

(*iii*) *University of Rochester School of Medicine and Dentistry, Rochester, New York.*

Course: Elective 12 hour seminar course to third and fourth year students following Dr. Sigerist's syllabus in a general way. No examination.

Lecturer: Dr. George W. Corner, Professor of Anatomy.

Library: Good, the Library contains about 1200 volumes, especially selected to serve the purposes of teaching and research in the history of medicine. It includes representation of the standard critical texts of medical classics and good renaissance editions, as far as funds have permitted. The collection is especially strong in anatomy, obstetrics, and gynecology, and in Salernitan medicine, American epidemics of yellow fever and cholera All the important periodicals are present in complete files.

Clubs: Medical History Club meets 2 to 5 times a year. Nearly all papers represent actual research; extramural speakers from the local optical industry, the local archeological group etc. There is no other medical history club in community but local hospital has had historical papers read at its weekly staff meetings; the Rochester Historical Society has published papers on local medical history.

Various: Future plan is to combine formal lecture course with advanced seminar, and activities of the club.

(*iv*) *New York Medical College and Flower Hospital, New York.*

Course: 1. Required 30 hour course for Freshmen. Examination required. 2. Required 15 hour course to Juniors and Seniors, part given by faculty members and partly by invited speakers.

Lecturer: Associate Professor E. Wallace MacAdam, to Freshmen. Faculty Committee and guest speakers to Juniors and Seniors.

Library: Fair. Also Library of New York Academy of Medicine.

Club: Faculty group was formed, dinner meeting once a month during school year. Did not prove successful and was dropped. Student society formed. 12 members of Senior class select 12 members of Junior class known to be interested in medical history. Nine faculty members selected. One meeting a month at home of faculty member.

Various: Plan. (*a*) Development of greater interest in historical problems among the staff itself. (*b*) Inclusion of historical papers in intra and interdepartmental meetings and hospital staff meetings. (*c*) Increased use of historical exhibits in library. (*d*) The use of library bulletin boards for the announcement of selected readings. (*e*) Greater employment of medical history in introducing new topics in diverse courses. (*f*) Establishment of a definite course in medical history exclusively in Junior year as a formal, required course emphasizing major trends in medical development and relegating "departmental" subjects in department involved. (*g*) Continuation and development of "guest" hour for Seniors.

(*v*) *University of Kansas School of Medicine, Kansas City, Kansas.*

Course: Required 22 hour course to Seniors. Examination required.

Lecturer: Dr. Logan Clendening, Professor of Clinical Medicine.

Library: Yes. Institute of the History of Medicine in progress of organization.

Club: None.

Various: Problem felt to be adequately solved.

* * * *

In Canada the teaching of medical history is infinitely better organized than in Great Britain and other Dominions. "The majority of the medical schools have Departments of the History of Medicine. Regular instruction is given in six schools while the other three schools give incidental lectures or a course on the History of Science and Civilization. Where no regular courses are given the authorities feel that they should be given and plans to organize them are being made. McGill University offers through the Osler Library excellent opportunities for research in medical history, but facilities are also available in Toronto and several other universities. The Osler Societies at McGill, Western Ontario and Alberta devote part of their activities to medical history, and special medical history societies have been found at Toronto, Manitoba and Alberta to which must be added the very active Club of the Calgary Associate Clinic. The organization of a society is being considered in Quebec. There is no doubt that Canada has made an excellent start, as was to be expected in the country of Osler."

VI. CONCLUSION

In the early days of this century, it was only the Sanskrit professors of the English, German and the French universities that studied and wrote on ancient Hindu Medicine, generally in their books on Sanskrit literature and occasionally, as learned monographs. Subsequently, Sanskrit scholars in India continued and extended these studies. Indian Historians and Indian Anthropologists are now beginning to realise how little we know of the subject and how urgent is the necessity for consolidation of the scattered facts and how vast the field was for research.

British pioneers who came out to India in the beginning of the last century were also the first to realise what a fascinating and inspiring field of study lay before them in India if they care to know the history of medicine in India. The works of H. H. Wilson, Royle, Ainsley, Wise etc., were undertaken

with this spirit. Later, qualified Indian medical men like Kunte of Bombay and G. N. Mookerjee of Calcutta began to interest themselves in ancient Hindu medicine. Many others soon followed suit. It may now be safely asserted that there are many qualified medical graduates of various Indian universities familiar with ancient Indian Medical texts in original Sanskrit and in translations. The motives of such study are however not entirely purely cultural and historical purposes. A large number seem to believe in the efficacy of certain therapeutic agents mentioned in old Indian texts and a few men maintain that even in the ancient basic doctrine of *Tridosha* is unassailable from the scientific point of view. This is a controversial matter and not at all connected with the object of this paper, namely promotion of knowledge of history of medicine, as a discipline.

John Shaw Billings who may be said to have popularised History of medicine in America gave a course of lectures on the History of Medicine at the John's Hopkins University, in the autumn of 1877. It is interesting to note that in this course of lectures he included "A discussion on Indian medicine —the Vedas, Sushruta and Charaka", probably before the lecture on Greek medicine. Last year, Heinrich Zimmer, formerly professor of Sanskrit of the University Heidelburg and now a refuge in America was invited to give a course of lectures on "Hindu Medicine" before The John Hopkins University School of Medicine, Institute of the History of Medicine.

Some of the older universities and some of the young but already famous universities in India have many endowments for university lectures, endowments for special chairs and lecturerships and make arrangements for extension lectures and university lectures on diverse topics of varying importance. They also sanction research grants and award research fellowships in various branches of study. It is very depressing and sad to contemplate that not one university and not one medical college in India has taken any interest in medical history till now. If the universities and medical colleges in Europe and America are interested not only in the History of modern Medicine with its Greek and Roman heritage but are equally interested in the history of medicine in India, in Persia, in ancient Egypt and Assyria and institute lectures on the various historical and cultural aspects of Oriental Medicine, is it too much to expect the Indian universities and the medical colleges in India to follow the upto date European and American models, even in this respect.

THE RELATION OF THE MEDICAL PRACTITIONER TO THE MEDICAL OFFICER OF HEALTH

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The existing relationship between the medical practitioner and medical officer of health is far from cordial nor is it clearly understood. Therefore, I have ventured to discuss briefly in this paper what this relationship is and why it is, what it is, and how it can be changed.

The practice of modern medicine is based upon diagnosis and treatment of diseases; preventive medicine or public health is based upon avoidance of infection and the building up of resistance of the individual against infection. Both these branches, the curative and the preventive, of scientific medicine, are based upon diagnosis, for without correct diagnosis, no satisfactory treatment nor an effective control over the spread of infection, either in the individual or in a community is possible.

For the purpose of diagnosis, bacteriological, microscopic, bio-chemical methods and x-rays are employed, which call for a high standard of technical skill and complicated equipment, in the practice of medicine, no less than in the practice of public health.

The practice of medicine is carried on by medical men known as the consultant, the specialist and the general practitioner. Physicians specialise in diseases of the heart, the lungs, and nervous system or the digestive system, in childrens' diseases, mental diseases, diseases of skin and tropical diseases. Some specialise in tuberculosis, venereal diseases, and surgeons devote themselves to the surgery of the ear, nose and throat, the eye, the brain, the abdomen, the genito-urinary system, or of the muscles, and limbs. Gynæcologists deal with the surgical conditions peculiar to women. We have also other specialists in diagnosis and treatment, such as the radiologists and those engaged in mechano or hydro-therapeutics. In addition to these, there are the pathologists and bacteriologists who help the clinicians in arriving at a diagnosis of the cause or the nature of a disease. From the above description of specialisation that exists in medicine, it is obvious that no single person can master the whole field of modern medicine, surgery, obstetrics and gynæcology. As the volume of knowledge that accumulates in every field is so great, specialism in the practice of medicine is becoming the order of the day.

The above mentioned type of specialists are mostly attached to teaching hospitals and institutions and are responsible for turning out medical graduates who are to be the future medical practitioners.

The medical practitioners, either set up private practice or are mostly absorbed in Government and State services, some adopt a public health career and some others take up resident medical appointments in hospitals. As general practitioners, they build up a good practice in towns and cities and engage in the treatment of all sorts of complaints, medical and surgical, both serious and trivial. As they see too many cases in a day, they are not able to pay much attention to their patients. They are pre-occupied with their own practice.

The general practitioner, being the product of specialists, who in their several fields make cure their object in treatment of diseases, considers it also his own aim and holds himself aloof from preventive medicine or public health and considers and treats it as lying entirely outside his province.

The medical officer of health, on the other hand is a qualified medical man, who is a public health specialist.

Public health has become unfortunately associated in the lay mind with sanitation and conservancy or a campaign against

bad smells and for the abatement of nuisances. The medical man of to-day, I regret to say, looks upon the Medical Officer of Health, as some one antagonistic to his own attitude and outlook on medicine.

The chief duties of a medical officer of health are (1) the control of infectious diseases (2) the control of food and water supplies (3) the supervision of vaccination (4) the registration of births and deaths (5) the supervision of child welfare and maternity work (6) school health work (7) supervision of sanitation and conservancy and (8) public health education.

The medical practitioner should be made to realise in the early part of the medical training that every illness has a dual aspect: one is the personal and the other social. The personal aspect in illness has been the chief concern of the medical man, and in its social aspect, that of the medical officer of health. He should be made aware of the communicable nature of infectious diseases and their modes of spread and to regard each case as a focus of spread of infection. He should be taught to note the environmental factors which have exposed the patients to the risk of infection such as bad housing or working conditions in a case of tuberculosis, or a case of cholera or typhoid, to unhygienic conditions in the house or a polluted water supply or dysentery to the prevalance of flies, and to co-operate with the medical officer of health to remedy them.

The medical practitioner, being the first to see the patient in his homes, forms the first line of defence against infectious diseases and his prompt notification to the medical officer of health is an essential step in the control of spread of infectious diseases. Without the vigilance and co-operation of the medical practitioner, the best efforts of the medical officer of health are sure to fail, in the control of infectious diseases. If the medical practitioner makes mistakes in diagnosis and regards a case of enteric fever or cholera as diarrhœa, diphtheria, as sore throat or early tuberculosis as an ordinary cough and fails to report to the medical officer of health, not only the patient will suffer inevitably from such mistakes, but also serious risks to the public health of the community are run by such missed diagnosis during the early part of an illness.

The medical practitioner is in the most advantageous position of giving advice to the family as to the preventive measures they should adopt to avoid infecting themselves and conveying it to others when an infectious case is treated at home, and to immunize the family contacts.

In view of the above considerations, it is necessary to make the medical practitioners, specialists in diagnosis and not a jack of all trades in treatment, aiming at a cure of all diseases. He should also function as the family health adviser.

In other words, as Sir Arthur Newsholme has stated, the medical practitioners should be urged to become "Medical Officers of Health within their own medical practice."

On the side of public health, I would suggest that for prompt notification of a correctly diagnosed case of infectious diease, the medical practitioners should receive a small fee as is the case in Great Britain where half a crown is paid per case for notification to the public health authorities, and for the early diagnosis of many of the important infectious diseases, the Public Health Department should provide laboratory diagnosis, free of charge, involving bacteriological and pathological examinations, to the general practitioners in the treatment of indigent cases.

The medical officer of health should serve as a consultant in preventive medicine specially in the diagnosis of infectious diseases and his services should be available in this respect to the medical practitioners. Such consultations should be more frequent as discussions of a difficult case help the medical practitioners and ensure early notification of an infectious disease.

The medical practitioners should also be supplied prophylactic vaccines, free of charge, by the medical officer of health. Such a measure will stimulate an enquiry into the methods of immunization and convey knowledge of health through the medical practitioners into the homes of the people. The provision of preventive health services alone leaves the greater part of health problems untouched. The maternity case requires competent attendance at delivery as well as supervision in the pre-natal period, control of communicable diseases of childhood requires not only preventive measures but also demands the treatment of the sick child.

Tuberculosis and venereal diseases control involves, both case-finding, adequate treatment of cases and their contacts, when found.

The activities of the public health department are bound to expand along these lines and necessitate the part time employment of qualified practitioners for running the appropriate clinics under the public health department. Such contacts will also help in modifying the existing attitude of the practitioners towards public health.

The medical officer of health, being interested in the reduction of general morbidity, should interest himself in any schemes which enlist the services of the medical practitioner and make them available to different classes of people in a community such as the national health insurance system or panel practice or the provision of sickness benefit fund to be set up by industrial undertakings in this country.

In these ways, vital links between the medical practitioner and the medical officer of health could be forged for the mutual advantage of both and in the interest of public service and in the efficient discharge of their respective duties of diagnosis, cure and prevention of diseases.

Finally, as the apathetic attitude of the medical practitioners towards public health officials, is, I am afraid, deep-rooted, it is necessary to reorientate medical teaching. To this end, I would suggest that in their training, the medical students should be taught the methods of investigation and procedures adopted by the public health department, to detect the sources of infection and administrative control of infectious diseases. In this connection, I cannot do better than quote from Dr. Ukil's presidential address to the section of the medical and veterinary research of Indian Science Congress held last year at Benares. He said "so far as Public Health was concerned, the Peking Union Medical College in China tried an experiment in 1934 which is worthy of consideration. As clinical clerkships are given to students in the hospitals to get an insight into the causation and pathology of diseases, in like manner public health clerkships were given to students for a couple of months at a Health Centre, working in collaboration with a regional hospital. The students studied the cases in the

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field in all the clinical, epidemiological and social bearings and control and actually participated in the methods of application of public health procedure. This helped to remove the idea from the mind of students that they had to deal with curative medicine alone in the Hospital, as also after passing out. A close co-operation between the clinical and public health groups of teachers and the arrangement for joint teaching was secured."

I hope the medical colleges and medical council in this country will adopt this suggestion and give it a trial.

It will not be out of place to give some relevant data on the question of improvement in mortality experience in India from various sources which indicate that considerable improvement in it is due in a large measure to public health activities in this country.

The actuary of the Oriental Government Security Life Assurance Company in his triennial valuation report in October 1940 states that an elaborate mortality investigation carried out by the company for five periods extending from 1874 to 1935 is as follows, taking the comparative figure as thousand:

Period	*I*	*II*	*III*	*IV*	*V*
Experience of years	1874-97	1874-1902	1874-1913	1905-25	1925-35
Comparative Mortality figure ..	1,000	1,122	1,089	932	627

The above figures are in the form of what statisticians call index numbers to measure secular trend or long term variation in any characteristic.

In the Actuarial report based on the 1931 census to the Government of India it is stated that generally speaking it can be said that influence of hygienic and economic factors that prevailed in decennium 1931 were such as to bring the condition of Indian population to the low mortality experience of 1891.

Dr. Ukil in his presidental address on January 6, 1941, to the section of Medical and Veterinary Research of the Indian Science Congress has shown the trend of the general mortality rate in India and Bengal as compared with that of England and U.S.A. for a period from 1880 to 1940. In India the trend of mortality was 21 per 1000 in the year 1880, and rose to 38 per 1000 in 1900, and has steadily declined to about 22 per 1,000 in 1937, whereas in England it has steadily declined from about 20 per 1,000 in 1880 to about 12 in 1937, but the infantile mortality rate per 1,000 live births for India, England and U.S.A. for a period from 1880 to 1937 show a decided reduction. Infant mortality rate in India was about 215 in 1890 and which rose to 230 in 1900, has shown a steady decline to about 160 in 1937, at the rate of reduction of 10 deaths per decade, whereas in England the rate which was 142 in 1880, rose to about 150 in the year 1900 and declined to about 55 in 1937 with a reduction of about 20 deaths per decade.

The same author states that the results obtained at the Health Unit Closepet subsidised by the Rockefeller Foundation in India show that the infant mortality among cases conducted by the Centre was 66 per 1,000 live births as compared to 157 in cases conducted by local dais and the maternal mortality conducted by the Centre staff was 1·8 per 1000 births as compared to 8·1 in cases conducted by the local dais. He further states that public health in India can be profitably purchased and that it has been shown that the death rate in the Army has been reduced from 10·8 in 1900 to 1·7 in 1937 among Indian troops and in the Indian jails, it has been reduced from 32·8 in 1900 to 1025 in 1937. The sickness rate has also greatly diminished.

It will be seen from the above statements and figures that Public Health in this country has a direct effect on the incidence of diseases and death rates and that if more funds are available than 5 pice per head of population, which is now provided and if the Public Health work is efficiently planned on scientific lines, it can without contradiction be stated that a further marked rapid reduction in the death and disease rates is possible and can be brought about by public health workers in this country working in co-operation with and through the medical practitioners.

Preventive medicine or public health is the superstructure of which the foundation is scientific medicine, whose chief endeavour is the preservation, protection and prolongation of life and the promotion of scientific investigations into the causes, diagnosis, treatment, and prevention of diseases that afflict mankind.

NOTES AND NEWS

MEDICAL LIBRARIES AND THE WAR

The war had a detrimental effect on medical libraries. The London ones have removed their more valuable contents to places which are safer from bombs but less accessible to readers. The Royal College of Surgeons, which has suffered much damage from bombs took precaution of removing a large part of its library to a place of safety which is too far away for readers. The Royal College of Physicians has had to store its library beyond access. The Royal Society of Medicine has evacuated about a thousand of its books within accessible reach of London. The London School of Hygiene has combined evacuation with limited accessibility. Another evil due to war is that the medical libraries so much used for the readers of foreign periodicals are now almost devoid of them. Since the collapse of France, periodicals have not been received from countries overrun by the German and very few are received from Germany. Thanks to the financial help of the Rockefeller Foundation, the Association of Special Libraries has undertaken a survey of the technical periodicals now reaching us from abroad, so that those which are received will be available when they are most needed.—*J. A. M. A.*

THE HEALTH OF CHILDREN IMPROVED BY MIGRATION TO THE COUNTRY

The City children (London) sent to country districts and allowed to settle down as a precaution against air raids adapted themselves to the ways of their hosts and the conditions of rural life. Practically all improved in physique, general health, poise and bearing. Pure air, wholesome food, and longer

hours of sleep brought about increase in weight and height, rosier cheeks and greater physical strength.

BENGAL CINCHONA PLANTATIONS

The annual report of the Government cinchona plantations and factory in Bengal for 1939-40 gives us the information that the total area under cinchona plantation at the end of the year was 3,168 acres and that the products obtained were 50,161 lbs of quinine sulphate and 28,305 lbs. of cinchona febrifuge. It is already known to all that India barely produces 1/10th of her requirements of quinine and imports the bulk of this drug from Java at a price much higher than the cost of production in India. Recent investigations have shown that 38,000 acres of suitable land are available in India for cinchona cultivation which could yield seven times the quinine required for India's needs.

The outbreak of hostilities in various parts of the world has not only dried up the supplies of quinine from Java but the Government price of quinine sulphate which was raised from Rs. 18 to Rs. 24 in February, 1940, now stands Rs. 37.

The Report states that "the situation points to the importance of quinine as key industry in the tropical countries. It is to be hoped that India will learn the lesson and make a serious effort towards the attainment of self-sufficiency in this essential commodity."

IS DISPENSING MANUFACTURING?

S. N. Biswas (*Indian & Eastern Chemist*, August, 1941) in distinguishing between dispensing and manufacturing writes:—

The registration of dealers under the Sales Tax Act has been going on. Some dispensing chemists and druggists have been registered as manufacturers. According to Concise Oxford Dictionary, "Manufacture" means "work up (material) for use, produce (articles) by labour especially on large scale." Manufacture is making of finished goods such as shoes, furniture, dresses, clothes, etc. The word manufacture both in its connotation and denotation, conveys to the mind the sense of large scale production and repetition of the same process or processes over and over again. Dispensing is individualist work. Dr. George L. Webster of the Illinois College of Pharmacy, in an article in the 15th August, 1940, issue of the N. A. R. D. Journal, declares that as a practitioner of his profession the pharmacist is an individualist. "This is necessary by the very nature of his service," he says, "Just as each prescription written by a physician is an individual medication for a particular set of symptoms, so each prescription filled by the pharamist demands his immediate personal supervision. The filling of prescriptions cannot be done on an assembly line. Each represents a special problem demanding the full attention of the individual from its beginning until it is ready for the patient. That is to say, pharmacists or our Indian chemists and druggists are individualists like other professonal men. In the above quotation mark the words, "individual medication," "immediate personal supervision," "not on the assembly line", "special problem," etc. Manufacture is mass production in which assembling or the joining together of different parts of an article produced by machinery is involved. Dispensing is individual work, it is part and parcel of pharmaceutics or pharmaceutical chemistry. It has been confounded with manufacturing because the professional character of the work has been lost sight of. We earnestly appeal to Mr. E. W. Holland, the Commercial Tax Commissioner, for having this question thrashed out before retail dispensing chemists and druggists are made liable to pay the Sales Tax, solely on the ground of their being considered as manufacturers.

DRUG ADULTERATION IN INDIA

The Report of the Biochemical Standardization Laboratory covering the period, 1937-40, shows that during the three years under report the Laboratory carried out a general survey of the quality of medical drugs in the Indian market, both imported and locally manufactured and distributed. Specimens of drugs from various parts of India were secured and more than 1500 samples of drugs were carefully tested both by pharmacological and chemical methods. In every case the report on the quality of the sample was forwarded to the party concerned. Particular attention was paid to certain drugs such as digitalis, adrenaline, cod-liver oil, quinine, insuline, organic arsenic and antimony preparations, essential oils, salts of heavy metals, salicylates, alkali salts, etc., which are commonly used in pharmaceutical practice and which are more liable to be adulterated or to undergo deterioration in tropical climate. This comprehensive survey, undertaken systematically by the Laboratory for the first time in India, has revealed that there can be no doubt about the seriousness of the situation regarding drug adulteration in this country. Perhaps a more alarming picture would have been presented if proper arrangements were available for checking imports policing of manufacturing houses, frequent inspection of retail dealers' stores, etc. With the enforcement of the Drugs Act, such investigation is now possible.

The Laboratory has also undertaken a large number of investigations in conection with drug standardization.

CENSUS OF ESSENTIAL DRUGS

With a view to maintaining a check on the import, manufacture and sale of essential drugs, a new order has been promulgated by the Central Government under the Defence of India Rules. The Order is called the Essential Drugs (Census) Order, 1941, and is to come into force at once.

In accordance with this order, any person engaged in the business of manufacturing, importing or selling such drugs, whether wholesale or retail, is required to submit to the authority specified for his area, so as to reach that authority not later than the 27th day of each month a return, showing the quality of any essential drug in his possession or under his control within British India on the 20th day of such month. No return, however, is required to be submitted if the total quantity of any essential drug in the possession or under the control of any person is less than that specified in the Order.

Every manufacturer, importer or dealer in drugs whether wholesale or retail, is required to keep a record of the purchase or sale of any quantity of an essential drug made by him, whether such quantity is less than specified or not. No record of such transactions, however, need be kept by a retailer if the total quantity of an essential drug in his possession or under his control is less than that specified.

The correctness of any return submitted or record kept in pursuance of this Order is subject to verification by any person authorised by the Central or the Provincial Government for this purpose. The person so authorised will have the right to enter and inspect the premises of any manufacturer, importer or dealer and to inspect and take copies of any records, books or accounts kept in connection with such business.

The following are the authorities specified for receiving the returns in the various areas:—

Madras, the Central Provinces and Berar, and Coorg. The Deputy Assistant Director General (Medical Stores), Madras.

Bombay Presidency, Sind and Ajmer-Merwâra—The Deputy Assistant Director General (Medical Stores), Bombay.

Bengal Presidency, Bihar, Orissa and Assam—The Deputy Assistant Director General (Medical Stores), Calcutta.

United Provinces, the Punjab, North-West Frontier Province and Baluchistan—The Deputy Assistant Director General (Medical Stores), Lahore.

THE NUTRITION COMMITTEE, BENGAL

The first annual report of the Nutrition Committee, Bengal, is just out. It is a document of great value on a matter of vital importance to the nation. The chief aim of the Committee is to pool all the available resources which can be utilised for the purpose of improving the nutritional status and thereby the health and physique of the people of Bengal within the limitation of social and economic frame work of the country. For the attainment of this larger objective the Committee is aiming at:

(*i*) Obtaining correct information on foods and food problems of the province, and the wide dissemination of practical and essential nutritional knowledge in both scientific and popular forms.

(*ii*) The planning and guiding of nutritional research, and the co-ordination of activities in this field by different workers, and institutions of the province.

(*iii*) The organisation of instruction in nutritional knowledge for medical and health personnel, labour liaison officers, school teachers, and others.

(*iv*) Advising the Government on all nutritional questions, and finally,

(*v*) Devising ways and means for the provision of optimum nutrition for the population through a well-planned policy for the production and distribution of food-stuffs.

The most practical method of attaining these objects was to divide the work among various sub-committees, and the Nutrition Committee at the very outset constituted 12 small technical committees to organise various aspects of its work. These were:—

1. Composition of Foods. 2. Dietary Studies. 3. Nutrition in relation to Public Health. 4. Nutrition in relation to Eye Conditions. 5. Nutrition in relation to Agriculture. 6. Nutrition in relation to marketing. 7. Technology of foods. 8. Basic Researches in Nutrition. 9. Food Standards and Adulteration. 10. Education and Publicity. 11. Statistical. 12. Publications.

These committees have expended much time and labour in the collection and compilation of available information on such aspects of the nutritional problems as fell under their purview.

The Committee is now planning the following popular publications:

(*i*) Suggestions for adequate diets and standard menus for Bengal. (*ii*) Diet for the infant and the mother. (*iii*) Nutritive value of the fish foods of Bengal. (*iv*) Milk and dairy products, their importance and use in nutrition. (*v*) Cereals and pulses.

These publications will be of great value in propagating scientifically correct knowledge on these basic foods.

During the last year the Committee has addressed itself to the question of nutrition teaching to several categories of medical and health personnel, labour liaison officers and other officials connected with the welfare of industrial labour, nurses and health visitors, school teachers and secondary school pupils. Courses were organised for two categories, namely, health visitors and school teachers. This activity is expected to be very much extended in the next year.

A scheme for the establishment of a permanent nutrition museum was put forward by the Committee and considered by the Corporation of Calcutta. A nucleus of this museum is shortly to be formed under the care of the publicity officer of Calcutta Corporation. The development of this museum will be a great step forward for the propagation of the knowledge of nutrition.

The problem which has engaged the serious consideration of the Committee has been the question of "family food consumption" and the means to improve it within the available family budget. Numerous investigations in Bengal have established the fact that improvement is urgently needed along three directions:

(*i*) Greater consumption of proteins and particularly of animal protein. (*ii*) Greater consumption of the mineral calcium. (*iii*) Greater consumption of vitamins A and D.

The Committee has also been alive to the fact that for quite an appreciable proportion of the population, apart from the question of quality, even the proper quantity of the cheapest forms of the food can not be assured. To meet each deficiency the Committee has considered from time to time certain tentative remedies. These are discussed in the report and the various publications of the Committee. The use of soya bean, rice polishings, groundnut cake, red palm oil, certain cheap fruits, home poultry, kitchen, gardens, etc., have received consideration.

The Committee has also attempted to plan how the nutritive value of existing foods could be improved and how agriculture and marketing can be made to serve the cause of better nutrition. At a future date as soon as enough facts will have been gathered to justify a definite food policy, the Nutrition Committee hopes to approach the Government with a clear cut five-year programme for the promotion of the health and nutrition of the people of Bengal.

Lastly perhaps it will be correct to state that the greatest achievement of the Committee consists in succeeding to pool the resources of no less than twenty-five different institutions, bodies and government departments interested in nutrition work. This co-operation has greatly stimulated nutrition studies and has helped to co-ordinate and direct them along right lines.

The Committee has been in existence only for one year. .During the course of this year, what the Committee has achieved is exceedingly creditable. The Government of Bengal should afford every facility and financial assistance to the Committee for the prosecution of its work, which is of a pioneering character and can well be an example to other provinces. We shall look forward to the work and achievement of the Committee in years to come.—*Science and Culture.*

CORRESPONDENCE

The Editor is not responsible for any views expressed by the contributor—EDITOR.

SOME FUNCTIONS OF THE SYMPATHETIC SYSTEM AS YET UNDISCOVERED

THE EDITOR,
Journal of the I.M.A, Calcutta.

Sir,

I have been observing certain phenomena as early as the year 1928, and have been working on them ever since by clinical and physiological observations upon myself, my colleagues, some students and patients and have come to the following conclusions:

1. That on lying in bed on the left side, the ventilation of the left nostril was absent or deficient, when compared with that on the right side, and lying on the right side showed deficient air entry through the right nostril.

2. That on examining the ventilation of each nostril at different times of the day, the amount of air entry was found to vary from side to side, even in the erect position of the body, the time for alternation of activity from one side to the other being approximately 1½ hours. This alternation of activity I now understand, our Yogis of yore were perfectly aware of. It is strange that physiologists have never noticed this alternation of respiratory rhythm.

3. That for a clue or an explanation of the causation of such alteration in the rhythm of breathing one should look to some sort of a nervous relation between the chest and the blood vessels of the nasal mucosa.

4. That from my experiments and observations it is reasonable to come to the conclusion, that the nasal obstruction was certainly due to an active capillary hyperæmia, and not a passive venous congestion of the nasal mucous membrane. Such an active capillary hyperæmia could be easily explained by an assumption of the interference of the normal tonicity of the upper sympathetic nerves.

5. That on the basis of their theory another interesting observation namely, the phenomenon rhythmic (periodic) hemilateral perspiration of the body can be explained.

6. That the case for the sympathetic in the above phenomena has been substantiated by my observations on a patient on whom bilateral stellate ganglionectomy has been performed.

Now that from my observations it is clear that the nasal ventilation rhythm is controlled by the sympathetic system, it should be automatically inferred that the normal alteration of nasal rhythm from one nostril to the other can only be due to the alternating tonic capacity of the right and the left sympathetic system. Having established the latter fact, one can theoretically arrive at certain facts of physiological importance, that in the normal individual, the bilateral organs in the body innervated through the sympathetic also must show this change of alternation of activity. My observations have already shown they do.

Starting from the top of the body, examination of the fundi, at different times, shows an alternating change in the amount of capillary dilatation in either eye. Similar changes taking place in the mucous membrane of the nose resulting in partial obstruction and alternation of the nasal rhythm has already been dealt with. Physicians have always noticed on auscultation of the chest, the air-entry on one side of the lungs preponderating over the opposite side. By ureteral catheterisation of the kidneys, the urologists have shown that the rapidity of secretion from either kidney alternated at different times; also the radiologist, when taking pyelograms has visualised the alternating opacity of the secreting kidney. And it may be inferred that all other bilateral organs in the body such as the suprarenals and testes also must show this change.

I feel certain that the above facts create a new opening in the study of the physiological aspects of the autonomic nervous system. I am, etc.,

K. C. NAMBIAR,
F.R.C.S., (Edin.), M.B.B.S., F.R.C.S., (Eng.),
Surgeon, General Hospital, Madras.

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ASSOCIATION NOTES

WORKING COMMITTEE, I. M. A.

Proceedings of the 3rd Meeting of the Working Committee of the Indian Medical Association, held at 4 p.m. on Sunday, the 26th October, 1941, at the Delhi Medical Association House, Daryaganj, Delhi:

Members present:—Dr. K. S. Ray (Calcutta) (in the chair); Dr. Bhupal Singh (Meerut); Dr. Jivraj N. Mehta (Bombay); Dr. R. A. Amesur (Karachi); Capt. P. B. Mukerji (Calcutta); Dr. A. Batty (Delhi), Co-opted under Rule 15-ii-A(c); Dr. S. C. Sen (Delhi) Co-opted under Rule 15-ii-A(c); Dr. A. P. Mitra (Delhi) Co-opted under Rule 15-ii-A(c).

Dr. A. K. Sen (Calcutta) was present on invitation by the President.

1. *Confirmation of the Proceedings of the last meeting.*

Resolved that the Proceedings be confirmed.

Arising out of the proceedings the ,General Secretary reported that copies of the Resolution of the Working Committee on the question of recruitment to the Emergency Commissions in the I.M.S. and Emergency Appointments in the I.M.D., passed at the last meeting, had been sent to the Press and circulated to the branches of the Association for their information and guidance.

The General Secretary also reported that the letter of Dr. A. C. Ukil together with the cutting from the *Presse Medicale* had been sent to the Editor of the *J. I. M. A.* for publication in the Journal, if possible, as per direction of the Working Committee at its last meeting.

The General Secretary further reported that a telegram was sent on 21-7-41 to Sir Reginal Maxwell, Home Member, Government of India, Simla, requesting a more liberal supply of petrol to the members of the medical profession as also a letter conveying the resolution of the Working Committee on the subject; no reply had been received till date from the Home Member.

2. *Audited Accounts for the quarter ended 30-6-41.*

Resolved that the Working Committee recommends to the Central Council that the Audited Accounts be adopted.

The monthly accounts for the months of April, May, June, July and August, 1941, were also examined; in this connection, the Working Committee expressed the view that the monthly accounts should, as far as possible, show the arrears of central fund contribution standing against each branch.

The General Secretary next placed before the Committee letters from the following branches asking for the amounts shown against each by way of central fund contribution to be written off as unrealisable:—

Nasik Rs. 21; Delhi Rs. 12; Punjab Provincial Branch 817-8-0; U. P. Provincial Branch Rs. 21; Bengal Provincial Branch Rs. 345; Poona Rs. 66-4-0; Vizagapatam Rs. 2.

Resolved that the Working Committee recommends to the Central Council that the above amounts be written off as unrealisable owing either to death, resignation or termination of membership due to non-payment of subscription, of the persons concerned.

In this connection it was decided that the Provincial and local branches should be requested to take special steps to prevent arrears of subscription in future.

3. *Formation of Branches.*

The General Secretary reported that since the last meeting of the Central Council the following branches of the Association had been formed:—

Fuleswar and Comilla in Bengal; Shillong in Assam; Raipur in C. P.; Ranchi in Bihar; Baroda, Bulsar, Surat and Pandharpur in Bombay Presidency; and Tanjore in Madras Presidency.

Resolved that the Working Committee recommends to the Central Council that the formation of the above mentioned branches be approved, subject to the formalities prescribed under Rule 6-C(a) being complied with in full.

In this connection the Working Committee places on record its thanks to the President, Dr. K. S. Ray, and the Jt. Hon. Secretary, Dr. Chamanlal Mehta of Bombay, who had toured Gujrat in July last at their own expense, and brought about the formation of the branches at Baroda, Bulsar and Surat in Gujrat.

The General Secretary placed before the Committee a letter dated 18th September, 1941, from the Jt. Hon. Secretary of the Bengal Provincial Branch wherein he had stated that the formation of the Noakhali Branch, which was being attempted at the time of the last meeting of the Central Council and which had been taken cognisance of at the meeting of the Central Council, could not be brought about.

Resolved that the letter from the Jt. Hon. Secretary of the Bengal Provincial Branch be referred to the Central Council for being recorded.

4. *Election of President and 3 Vice-Presidents for the year 1942.*

The Working Committee reports to the Central Council that the following members having obtained the largest number of votes from the branches, be declared elected as President and Vice-Presidents:—

President:—Dr. K. S. Ray (Calcutta).

Vice Presidents:—(1) Dr. A. Said (Karachi); (2) Dr. Subodh Datta (Calcutta); (3) Dr. Rao Bahadur T. S. Tirumurti (Madras).

5. *To consider the opinions received from the persons written to on the subject matter of the resolution of Dr. K. Krishnamurty.*

The General Secretary placed before the Committee the summary of the opinions received.

Resolved that the Working Committee after considering the replies received, is of the opinion that the proposition is not a practical one, and that Dr. Krishnamurty may be informed accordingly.

6. *Benevolent Fund Scheme.*

The Working Committee considered the note submitted by the General Secretary.

Resolved that the consideration of the scheme be postponed till after the war is over and conditions have reverted to normal.

7. Consideration of a letter dated 14-6-41 from Dr. Radhakanta Goswami re. legal and basic right of a medical man for acceptance or refusal of a call.

The letter received from Dr. Goswami as also the opinions received from the various branches on the same were placed before the members of the Working Committee by the General Secretary.

Resolved that (*a*) the General Secretary be requested to ascertain from Dr. Goswami the terms and conditions of his service with the District Board under which he is employed and (*b*) an Honorary Legal Adviser be retained for the Association on a nominal honorarium and this case be referred to him for legal opinion.

8. *Consideration of the desirability of forming a Central Ethical Sub-Committee and of recommending formation of Provincial and Local Ethical Sub-Committees and of laying down rules for co-ordinating their activities.*

The General Secretary placed before the Committee two letters received from the Hon. Jt. Secretary of the Bengal Provincial Branch dated 20th and 27th June, 1941, in this connection.

Resolved that the opinions of the branches be sought on the desirability of the formation of the above Sub-Committee.

Resolved further that the attention of the members of the Association be drawn through the Branch Secretaries to the Ethical Rules adopted by the Association and published in the May, 1941, issue of the *J. I. M. A.* and that the latter be requested to inform the Hon. Gen. Secretary what action is being taken by them to make the implications of these rules known and observed.

9. *Miscellaneous.*

(*a*) (*i*) Dr. Mrs. Khalif's application for membership of the I.M.A.

(*ii*) Interpretation of the term "Indian Nationals" appearing in Rule 7 of the I.M.A. Rules.

The above two items were taken together for consideration.

In this connection the General Secretary placed before the Committee a letter dated 4-7-41 from Dr. Chamanlal Mehta of Bombay (Convener of the Foreign Qualifications Sub-Committee) asking for an interpretation of the term "Indian Nationals" as contemplated in Rule 7 of the Rules of the I.M.A.

Resolved that the matter be referred to the Legal Adviser to be appointed for the Association and action be taken after his opinion has been received.

(*b*) *Publicity Scheme of Mr. H. K. Chatterjee.*

Resolved that the Working Committee does not accept the Scheme suggested.

(*c*) Letter dated 25-9-41 from the Karachi Medical Association to the President, College of Physicians and Surgeons, Bombay, *re.* grant of M.C.P.S. instead of L.C.P.S.

Resolved that the letter be recorded.

(*d*) Letter from Dr. Chamalal Mehta *re.* waiving of Susbscription from members joining Emergency Commissions in the I.M.S.

Resolved that the suggestion cannot be approved of.

(*e*) Letter dated 3-8-41 from the Howrah Branch re. enrolment of two kinds of members *viz.*, one for the I.M.A. and the other at a cheaper rate of subscription, not joining the I.M.A.

Resolved that the consideration of this item be postponed until the opinion of the Bengal Provincial Council is received.

(*f*) Letter dated 15-9-41 from the Bengal Provincial Branch *re.* mode of payment of central fund contribution by local branches.

The correspondence between the Central office and the Bengal Provincial Branch was considered.

Resolved that where a convention has been established regarding paayment of the central fund contribution by the local branches through the Provincial Branch, the same procedure may be followed; and, in the case of other branches unless otherwise desired by the Provincial Branches concerned, the central fund contribution be collected direct by the Central Office.

Resolved further that the opinion of the branches be elicited regarding direct realisation of central fund contribution from the members either by despatch of Journal or a demand card by V. P. P. or by any other method they may suggest.

(*g*) Letter dated 23-9-41 from the Kankurgachi Branch *re.* correspondence on collection of subscription from members to be conducted by the Hon. Treasurer, I.M.A., Central Council, through the Provincial Office.

Resolved that the consideration of this matter be postponed to the next meeting of the Working Committee.

(*h*) Application from the South Indian Provincial Branch for a grant of Rs. 100 for propaganda.

Resolved that the consideration of this item be postponed to the next meeting of the Working Committee.

(*i*) The General Secretary reported that in pursuance of the resolution of the Working Committee at its last meeting held on 26th and 27th July, 1941, Mr. S. B. Dass Gupta had been appointed to the post of Accountant on Rs. 50-5|2—75| with effect from 10-9-41 and (*ii*) Mr. J. J. Bhattacharjee as Typist-Clerk on Rs. 35-3|2—50| with effect from 1-9-41 (both on probation for six months), after due advertisement.

Resolved that the appointment on probation of Mr. S. B. Dass Gupta and Mr. J. J. Bhattacharjee, be approved.

With regard to the appointment of the typist-clerk for Journal work as sanctioned by the Working Committee at its last meeting, the General Secretary reported that he had sent copies of the Resolution of the Working Committee in this connection to the Secretary of the Journal Committee and he had also sent two other letters asking whether he may forward all the applications received for the post of typist-clerk to him, for selection of a suitable candidate by the Journal

Committee. No reply had been received for any of the letters to date.

(*j*) Letters of resignation from Capt. P. Ganguly, Dr. A. K. Sen and Dr. P. N. Ray.

The General Secretary reported that the officers concerned had since withdrawn their letters of resignation and, hence, the consideration of the item did not arise.

(*k*) Consideration of the question of circulation of the brochure "The Indian Medical Service and Emergency Commissions" under circumstances different from what obtained at the time of its publication.

The President and the Hon. Gen. Secretary explained to the Committee the circumstances under which the above article had been published in the August issue of the I.M.A. under "Association Notes" instead of as Editorial in the July, 1941, issue, as was originally contemplated.

In this connection the letter dated 18-9-41 from Dr. Jivraj N. Mehta, M.D., M.R.C.P., Bombay, to the Hon. General Secretary I.M.A., Calcutta, was also considered.

Resolved that the brochure be circulated to the members of the Central Legislative Assembly, the Branches of the I.M.A., H.E. the Commander-in-Chief, the Defence Secretaries and the Editor of the *Manchester Guardian*.

Resolved further that copies of the brochure be sent to Mr. Menon (Congress Representative in Great Britain), London, requesting him to circulate the same among those members of Parliament who take an active interest in Indian affairs.

Resolved further that the above circulation be done after changing the foot-note on page 10 of the brocure to correspond with the publication of the article in the Journal and necessary deletions in lines 4 and 5 on page 5.

(*l*) Correspondence between the Hon. Gen. Secretary, and Chairman Journal Committee, regarding payment of bonus to clerk N. K. Chatterji, and

(*m*) Correspondence between the Hon. Gen. Secretary Chairman, Journal Committee, *re.* minutes of the Journal Committee meeting held on 22-7-41.

Postponed till a reply is received from the Chairman of the Journal Committee to the letters of the Hon. Gen. Secretary.

(*n*) Consideration of Resolution No. 1 passed by the Journal Committee at its meeting held on 14-9-41. Postponed.

(*o*) Consideration of clerk N. K. Chatterji attached to the Journal Department being absent from duty without leave from 1-10 41 to 14-10-41 and correspondence relating thereto between the Hon. Gen. Secretary, the Business Manager of the J.I.M.A. and the clerk.

(*a*) The Working Committee is of opinion that all applications for leave shall be dealt with by the Hon. General Secretary in accordance with the Rules;

(*b*) Applications for leave of the staff doing Journal work shall be addressed to the Hon. Gen. Secretary through the Business Manager of the J.I.M.A. with his endorsement and the General Secretary will take into consideration the recommendation or otherwise of the Business Manager in disposing of the applications, subject to the provisions of the leave rules.

In the unavoidable absence of the General Secretary, and the Headquarters Jt. Hon. Secretary, the Business Manager can grant such leave as he thinks fit according to the leave rules, subject to the subsequent approval of the General Secretary.

In the case of the Head Clerk and the Accountant, the General Secretary should consult the Business Manager before disposing of their application for leave.

(*c*) The Working Committee requests the Business Manager to direct the clerk-in charge of Journal accounts to make over the same to the newly appointed Accountant of the Association.

(d) In the particular instance of the Journal Clerk, N. K. Chatterjee, having gone on leave, the matter may be regularised as per directions given above.

(p) Application for confirmation of Mr. P. S. Narayanaswamy.

Resolved that Mr. P. S. Narayanaswamy be confirmed in his post as Head Clerk on a grade of Rs. 75-5-100 with effect from the 1st October, 1941, as his probationery period terminated on the 30th September, 1941, and the General Secretary recommended the application.

(*q*) Resolutions of Dr. R. A. Amesur.

(*r*) Consideration of the general situation regarding recruitment into Army Medical Services.

The above two items were taken together for consideration. The following resolution was passed:—

The Working Committee of the Indian Medical Association reiterates its view that all medical appointments in the country should be thrown open to all Registered Practitioners and, in view of the emergency created by the war, the commissioned ranks in the Indian Medical Service should also likewise be open to all.

(*s*) Any other relevant matter.

(i) Letter dated 15-9-41 from the Hon. Secretary, Indian Medical Union, Nairobi, *re.* affiliation to the I.M.A.

Resolved that affiliation be permitted as contemplated in Rule 22-C.

At this stage the meeting terminated at 10-30 p.m. and the consideration of the following items could not be taken up.

(ii) Letter dated 9-10-41 from Messrs. Carr & Co. Ltd., Bombay *re.* prohibition by the Govt. of importing into India from Canada foodstuffs such as Cow and Gate Milk Food etc.

(iii) Resolution adopted by the Kankurgachi Branch at their meeting held on 11-10-41 *re.* change of rules for the formation of the Working Committee, to be placed before the Annual Meeting of the Central Council.

(iv) Letters from Karachi Medical Association to the Director of Health Services in Sind, *re.* personnel of the Provincial Selection Board for recruitment to the Emergency Commissions in the I.M.S.

(v) Letter dated 10-10-41 from Dr. B. C. Vad, Bombay, to the President, I.M.A. *re.* Interpretation of Medical Reciprocity by the President of 153rd session of the General Medical Council of U. K. on 27-5-41.

CENTRAL COUNCIL, I.M.A.

Proceedings of the LVII Meeting of the Central Council of the Indian Medical Association held on Tuesday, the 28th October, 1941, at 5 p.m. at the Delhi Medical Association House, Daryaganj, Delhi:

Members present:—(1) Dr. K. S. Ray, (Calcutta) in the chair; (2) Sir Mangaldas V. Mehta, (Bombay); (3) Dr. B. C. Roy, (Calcutta); (4) Dr. Jivraj N. Mehta, (Bombay); (5) Dr. Bhupal Singh, (Meerut); (6) Rai Bahadur Dr. B. N. Vyas, (Lucknow); (7) Dr. R. A. Amesur, (Karachi); (8) Dr. Aghorenath Ghosh, (Calcutta); (9) Dr. T. N. Ghosh, (Calcutta); (10) Dr. Dalip Chand Bahl, (Ambala Cantt.); (11) Dr. Ram Karan Aggarwal, (Ambala City); (12) Dr. P. V. Ramachandra Reddy, (Nellore); (13) Capt. S. C. Sen, (Delhi); (14) Dr. A. K. Sen, (Calcutta); (15) Major Gen. D. P. Goil, (Meerut); (16) Dr. A. D. Mukharji, (Calcutta); (17) Capt. K. P. Bagchi, (Agra); (18) Dr. S. B. Vyas, (Meerut); (19) Capt. P. B. Mukerji, (Calcutta).

Before commencement of the business of the meeting the following resolution was moved from the chair and unanimously passed, all standing:—

"The Central Council of the I.M.A. placed on record their deep sense of sorrow at the untimely demise of Dr. Khan Chand Dev, Lahore, Dr. Parmeshwar Das Soni, Ambala City, Dr. Ramgopal, Mainpuri, Dr. D. Lal, Dr. Akhori Anand Prakash and Dr. Pasupati Nath Varma of Gaya, Dr. Ramchand Gianchand Advani, Hyderabad (Sind), Dr. J. M. Modak, Calcutta and Dr. Ashutosh Das, Serampore, and convey their heartfelt sympathies to the members of the bereaved families."

"Resolved further that a copy of the above resolution be forwarded to the members of the families of the deceased."

1. *Confirmation of the proceedings of the last meeting.*

The General Secretary placed before the Council a letter received from Dr. B. K. Ghosh of Barrackpore stating that, although he was present at the last meeting of the Council, his name had been left out in the list of members present at the meeting. The General Secretary reported that Dr. Ghosh's signature did not appear in the list taken at the meeting, but recommended that his name may be included in the proceedings now. *Resolved* that the name may be included in the list of members present at the last meeting of the Central Council.

, The General Secretary also placed before the House a letter dated 16th September, 1941, from Dr. Jivraj N. Mehta of Bombay, regarding deletion of the words "during the period of the war" appearing under Item No. 5 (2) after the first word "That" in line 1.

Resolved that these words be deleted.

The Proceedings were confirmed with the abovementioned modifications.

2. *To note the agenda and proceedings of the Working Committee Meetings, held on 26th and 27th July, 1941, and on 26th October, 1941.*

The General Secretary placed before the Council the Agenda and Proceedings of the Working Committee Meetings held at Bombay on 26th and 27th July, 1941, and at Delhi on 26th October, 1941.

In this connection it was resolved that, in future, the Agenda of the Working Committee Meetings should also be circulated, as far as possible, with the Notice and Agenda of the meeting of the Central Council.

3. *Audited Accounts for the quarter ended 30th June, 1941.*

Resolved that the Audited Accounts be adopted as recommended by the Working Committee.

Resolved further that the amounts of outstanding contribution shown against the following branches be written off as unrealisable owing either to death, resignation or termination of membership due to non-payment of subscription of the persons concerned, as per recommendation of the Working Committee:—

Nasik Rs. 21; Delhi Rs. 12; Punjab Provincial Branch Rs. 817-8-0; U. P. Provincial Branch Rs. 21; Bengal Provincial Branch Rs. 345; Poona Branch Rs. 66-4-6; Vizagapatam Rs. 2.

4. *Formation of Branches.*

The formation of the following branches of the Association was approved, as per recommendation of the Working Committee:—

Fuleshwar and Comilla in Bengal; Shillong in Assam; Raipur in C. P.; Ranchi in Bihar; Baroda, Bulsar, Surat and Pandharpur in Bombay Presidency; and Tanjore in Madras Presidency.

The letter from the Jt. Hon. Secretary of the Bengal Provincial Branch, I.M.A., dated 18th September, 1941, regarding the Noakhali Branch not having come into existence, was recorded.

5. *Announcement of the names of the Presidents and Vice-Presidents for 1942.*

On the report of the Working Committee, it was resolved that the following gentlemen be declared duly elected to the offices of President and Vice-Presidents, they having received the largest number of votes from the branches:—

President:—Dr. K. S. Ray, (Calcutta).

Vice-Presidents:—(1) Dr. Subodh Datta, (Calcutta); (2) Dr. A. Said, (Karachi); (3) Rao Bahadur Dr. T. S. Tirumurti (Madras).

6. *Consideration of any other matter which may be referred by the Working Committee.*

(*a*) Arising out of the proceedings of the Working Committee Meeting, held on 26th October, 1941, under items No. 9 (*q* & *r*), the following resolutions was passed by the Central Council on the question of Recruitment to Emergency Commissions in the I.M.S.

"The Central Council of the Indian Medical Association recommends that, in view of the emergency created by the War, the commissioned ranks in the Indian Medical Service be thrown open to the Licentiates and that, except where the terms of service otherwise demand, medical appointments in the country should be thrown open to all registered medical practitioners, holding qualifications in Western Medical Science as defined in the Indian Medical Degrees Act, 1916, Clause 2 (Act VII of 1916)".

(*b*) In view of the resolutions passed by the Central Council at its meeting held at Calcutta on 13th July, 1941,

and the recent announcement made by the Government regarding personnel of the Central and Provincial Recruitment Advisory Boards, the President made a statement that the more important recommendations of the the I.M.A. in this connection had not been accepted by the authorities and that the I.M.A. has not been consulted in the formation of the Advisory Committees although some members have been included in it in their individual capacity, and he, therefore intended to resign his membership of the Provincial Recruitment Board for Bengal to which he had been nominated, as he would serve no useful purpose by remaining a member, and was issuing the following Press Note:—

> "I regret to say that as the Government have not accepted most of the important recommendations of the Indian Medical Association as passed by its Central Council last July and in view of the fact that, in the selection of Non-official personnel of the various Central and Provincial Committees to advise on Emergency Commissions in the Indian Medical Service, the Indian Medical Association has not been consulted, I am sending my resignation of the membership of the Bengal Provincial Committee, as I find that I will not be able to serve any useful purpose."

The following resolution was then passed by the Council:—

"In view of the fact that the Government have ignored the essential demands of the Indian Medical Association concerning the Indian Medical Service and the Indian Medical Department, as enunciated in Resolutions Number 1 to 5 under Item 5, passed at the meeting of the Central Council held at Calcutta on the 13th July, 1941, and specifically, in the matter of representation of the I.M.A. on the Central and Provincial Recruitment Boards, appointed to advise on recruitment into the Emergency Commissions in the Indian Medical Service, the personnel whereof has just been announced, the Central Council puts on record its entire disapproval of the policy of the Government in those respects.

The Central Council appreciates, in this connection, the action of the President of the Association resigning, by way of protest, his membership of the Bengal Provincial Recruitment Board."

K. S. RAY, *President.* P. B. MUKERJI, *Hony. General Secretary.*

U. P. PROVINCIAL BRANCH—Proceedings of the meeting of the Working Committee, held at Capt. K. P. Bagchi's residence, Agra, on 25th October, 1941, at 12-30 p m.:

Members present—Capt. K. P. Bagchi, President (in the chair), Dr. Bhupal Singh, Dr. Makhan Lal Shingal, Capt. R. N. Bose, Dr. O. Prasad and Dr. S. B Vyas.

1. Proceedings of the last Working Committee meeting held on 14-10-41 were read and confirmed.

2. To consider and prepare agenda of the Provincial Council meeting:—

To be added to the agenda under item No. 7.

(*a*) This meeting of the Working Committee considered circular No. 1 issued over the signatures of the following members belonging to the Muzaffarnagar branch of the I.M.A. along with 3 non-members, from the office of the Reception Committee, Muzaffarnagar dated 2-10-41:

Drs. Babu Ram Garg, Hira Lal, Anand Prakash, Chandan Swarup Gupta, Jagdish Prasad.

The Working Committee is of opinion that the above circular definitely comes under 'undesirable conduct' as specified in Rule 13-C (Central), being prejudicial to the interest of the Association.

Resolved that the matter be referred to the Provincial Council for necessary action.

(*b*) The notice issued by Dr. Babu Ram Garg of Muzaffarnagar to the Hony. HQ. Provincial Jt. Secretary threatening action against those who were responsible for passing the resolution regarding "the supposed allegations said to be made by" him against the Secretary and thus putting him to dishonour by circulating the resolution among the members of the Association throughout the Province, was considered:—

Resolved that the matter be referred to the Provincial Council.

(*c*) Considered carefully letter dated 12-10-41 over the signatures of Dr. Jagdish Chandra Sharma, M.B.B.S., of Muzaffarnagar said to be the proceedings of the Annual General meeting of the Muzaffarnagar Medical Association held on 11-10-41 as also letter from the Hony. Secretary Dr. S. Halder of Muzaffarnagar repudiating the validity of the above-mentioned meeting:—

Resolved that in the opinion of this Working Committee the aforesaid meeting was unconstitutional and invalid and the matter be referred to the Provincial Council for confirmation.

(*d*) Considered letters from Major General D. P. Goil and Dr. Hira Lal, requesting that they may be put before the Provincial Council:—

Resolved that their request be acceded to and letters be placed before the Provincial Council.

With a vote of thanks to the chair, the meeting dispersed.

* * * *

Proceedings of the Annual Provincial Council meeting, held on 25-10-41, at Capt. Bagchi's residence.

Members Present—Capt. K. P. Bagchi, President (in the chair), Drs. M. L. Dang, Dehra Dun, M. L. Shingal, Khurja, O. Prasad, Meerut, Capt. A. P. Misir, Rai Saheb, Benares, Dr R. C. Chaurasia, Meerut, Capt. H. N. Shivapuri, Lucknow, Dr. S. C. Sen Gupta, Lucknow, Capt. S. K. Chaudhry, Benares Drs. L. K. Ray, Meerut, J. N. S. Sarin, Agra, Benarsi Das, Agra, G. R. Tandon, Agra, Bhupal Singh, Meerut; S. B. Vyas, Meerut, and Capt. R. N. Bose, Meerut.

1. Proceedings of the last Annual Provincial Council meeting of the I.M.A., U. P. Provincial branch held on 27-10-40 were confirmed.

2. Hony. Provincial Secretary's report for the year 1940-41 was adopted.

3. Audited Accounts for the year 1940-41 were adopted.

4. Election of office-bearers for the year 1941-42:—

(a) *Hony. Provincial Secretary.*

Dr. Bhupal Singh proposed Capt. R. N. Bose as Provincial Secretary. Seconded by Capt. S. K. Chaudhry and unanimously accepted by the House.

Dr. Bose withdrew. Then Capt. H. N. Shivapuri of Lucknow was proposed by Capt. S. K. Chaudhry. Seconded by Dr Bhupal Singh.

Carried unanimously.

(*a*) (*i*) Resolved that this Provincial Council of the I.M.A. puts on records its appreciation of the valuable services rendered by Capt. R. N. Bose, the out-going Secretary during his term of office as Hony. Provincial Secretary.

(b) *Hony. HQ. Provincial Joint Secretary.*

Capt. H. N. Shivapuri nominated Dr. Hans Raj of Lucknow.

2 Joint Secretaries—Dr. S. B. Vyas,, Dr. K. P. Tewari, Benares.

(c) *5 Headquarters members of the Provincial Council*—Drs. Panna Lal Sud, S. C. Sen, K. N. Basu, Tara Chand, Abdul Hameed,—all of Lucknow.

(d) *4 members for the Working Committee.*

Drs. S. C. Sen, Tara Chand, Abdul Hameed, Panna Lal Sud, Lucknow.

5. Delegation of the powers by the Provincial Council to the Working Committee for carrying on its work during 1941-42.

Resolved that the Provincial delegates its powers to the Working Committee for carrying on its work during 1941-42.

6. Consideration of the advisability of holding the VIII U. P. Medical Conference:—

This Provincial Council meeting endorses the decision of the Working Committee not to hold the Conference at Muzaffarnagar or Meerut in the circumstances prevailing there.

Resolved that it is advisable to hold the VIII U. P. Medical Conference and the Working Committee is requested to make efforts to hold the same.

7. The following item were taken up with the special permission of the Chairman:—

(*a*) Resolution of the Working Committee No. *2(a)* dated 25-10-41 was put up:—

This Council agrees with the view that the Working Committee has taken in this matter and requests the Working Committee to take necessary action under Rule 13-C (Central rules).

(*b*) Resolution of the Working Committee No *2(b)* dated 25-10-41, was put up:—

Resolved that this Council notes with regret the undesirable tone and language of the communication No. 13 dated 22-10-41 from Dr. Babu Ram Garg of Muzaffarnagar to the Hony. HQ. Provincial Jt. Secretary and is satisfied that the allegations made by him are baseless.

(*c*) Resolution of the Working Committee No. *2(c)* dated 25-10-41 was put up and confirmed.

(*d*) Resolution of the Working Committee No. *2(d)* dated 25-10-41 was put up:—

The letter of Major General D. P. Goil, Meerut and of Dr. Hira Lal of Muzaffarnagar were read and considered:—

Resolved that in the opinion of this Council no useful purpose will be served by the suggested enquiry at this stage. With a vote of thanks to the out-going President, Dr. Benarsi Das and present President Capt. K. P. Bagchi, the meeting dispersed.

* * * *

Dr. S. B. Vyas, Hony. Jt. Secretary announced that the office of the Provincial Secretary, U. P. Provincial Branch of the I.M.A. shifted to 43C, Cantonment Road, Lucknow, with Capt. H. N. Shivapuri as the Hony. Provincial Secretary.

The office will close at Meerut on 10th November, 1941, and re-open at the above-mentioned address on the 15th November, 1941. All communications should, therefore, be addressed to the Lucknow Office.

SOUTH INDIAN PROVINCIAL BRANCH—The fourth quarterly meeting of the Provincial Council was held at 'Trichy X-Rays Ltd.', Teppakulam, Trichinopoly at 9 a.m., on 25-10-41.

Members present—Dr. D. V. Venkappa,, President; Dr. T. S. Tirumurthi, President-elect; Dr. D. Rajamanikkam, representing Chingleput Branch; Dr. Stephen Lucas, representing South Arcot Branch; Dr. P. A. S. Raghavan, representing Trichinopoly Branch; Dr. O. R. Balu, representing Trichinopoly Branch; Dr. R. Kalamegham, representing Trichinopoly Branch; Dr. N. Krishnamurthi, representing Madura Branch; Dr. M. V. Natesan, representing Madura Branch and Secretary.

Dr. T. S. S. Rajan was present on invitation as a distinguished visitor.

The minutes of the last meeting of the council held at Cuddalore on the 28th June, 1941, were read and adopted. In this connection, on the suggestion of Dr. Tirumurthi and other members, the following resolution was moved from the chair and carried unanimously:—

Resolution No. I. This meeting further re-affirms Resolution No. VII passed at the last (Cuddalore) meeting of the council and authorises the Secretary to communicate copies of it to the Press and the Government. (*Note.* Resolution No. VII runs as follows:—"This meeting views with disapproval the recalling of retired men back to service in superior posts as it blocks the prospects of senior men still in service in the already limited number of superior posts that are open to them, this could not be considered as an emergency measure due to the War as it is the junior members who are called up for War service and as the senior members would have automatically been promoted to these higher posts, war or no war, if retired men were not recalled to duty.")

Election of the President of the Provincial Council for the year 1941-42: The Secretary reported that the amended Rule No. 10 laying down the procedure for electing the President has been passed by all the local branches. He also reported that of the eight branches then existing five, *viz.*, those at Chingleput, Trichinopoly, Madura, Ramnad and Tinnevelly have unanimously elected Dr. T. S. Tirumurthy as

President whereas the other three branches have not sent any reply to the circular of the Secretary calling for nominations.

The majority of votes having been in favour of Dr. Tirumurthi and no other names having been mentioned by any branch, the Secretary formally proposed that

Resolution No. II. "Rao Bahadur Dr. T. S. Tirumurthi, B.A., M.B., C.M., D.T.M. & H., be elected as the President of the South Indian Provincial Branch for the year 1941-42."

Seconded by Dr. P. A. S. Raghavan and supported by Drs. R. Kalamegham and Rajamanikkam the resolution was passed unanimously.

The accounts for the period 18-6-41 to 24-10-41 were passed.

The Secretary reported that there was some discontent among licentiates on the apparent omission by the Central Council and the Working Committee of the I.M.A. and the representative who attended the conference convened at Simla by the Government for acclerating recruitment to war service, to espouse the cause of licentiates who were acutely discontented with the terms and conditions of war service offered to them. This having led to individual protests made to the Secretary and to the passing of some resolutions voicing such feelings at the joint meeting of the Trichinopoly, Madura, Ramnad and Tinnevelly branches held on the 23rd August, 1941 at Courtallum, the Secretary informed the General Secretary of the I.M.A. about the feelings here. . ,

The replies received from the General Secretary and the President, Dr. K. S. Ray were read to the mmbers. They explained in detail how Government were mainly responsible for limiting the discussion at the conference to graduates and how the existence of a separate body as the All-India Medical Licentiates Association placed the Indian Medical Association in a very embarrassing position. The President and the General Secretary repeatedly assured in their letters their interest in licentiates was as deep and abiding as, if not more than, their interest in the rest and pleaded for the amalgamation of the I.M.A. and the A.-I.M.L. Association as it was the existence of two organisations which enabled Government to play the one against the other.

The following was moved from the chair and passed unanimously :—

Resolution III. Recording letter No. 1095|40-41, dated 16-9-41 from Dr. K. S. Ray, President of the I.M.A. and letter No. 1108|40-41, dated 20-9-41 from the General Secretary, I.M.A. this council is completely satisfied with the reasons given by the President and the General Secretary and is deeply impressed by the admirable sentiments expressed by them. This council further thanks the President and the General Secretary for the service they have rendered and are rendering to the I.M.A. and the medical profession in India courageously and impartially.

This council requests the Secretary to send copies of the above resolution to the President and the General Secretary of the I.M.A.

Recognition of new branch—The District Medical Association, Tanjore, having resolved to become a branch of the Indian Medical Association and remitted the central fund contributions in respect of 44 members, the council gladly accorded formal recognition of that district medical association as branch of the I.M.A. with effect from the 1st October, 1941.

Provincial Conference—The Council had at its Madura meeting on 8-3-41 decided to hold the First Provincial Conference at Trichinopoly. At the Cuddalore meeting it was decided to hold the conference in November. The Secretary reported that on account of the paucity of exhibitors due to the war and the absence of a certain number of medical men on war service and the general economic condition and the lack of funds of the Provincial Branch the holding of such a conference in November may not be possible. The members representing the Trichinopoly branch were, however, sanguine that they could manage it and were good enough to assure the council that they would hold themselves responsible financially and otherwise, for the success of the conference and so pressed the council to hold the conference in Easter week in 1942.

Dr. D. V. Venkappa, the President, representing Madras invited the conference to Madras and showed a copy of the resolution to that effect that was going to be moved that day in Madras at their annual meeting.

The following was passed :—

Resolution No. IV. Resolved that, gratefully accepting the prior invitation of the Trichinopoly branch, the First Provincial Conference of the South Indian Provincial Branch of the Indian Medical Association be held in Trichinopoly in Easter week in 1942.

Further resolved that a committee consisting of the follow ing members be formed to fix the programme, delegation fees and other details, the Secretary to report its decisions to the council at its next meeting.

Dr. T. S. Tirumurthi, President, *ex-officio;* Dr. T. S. S. Rajan, President, Trichinopoly Branch; Dr. P. A. S. Raghavan; Dr. O. R. Balu; Dr. R. Kalamegham; Dr. M. V. Natesan, Secretary, *ex-officio* with powers to co-opt.

This council is deeply grateful to Dr. D. V. Venkappa for the invitation he has extended on behalf of the Madras branch for holding the conference in Madras and will avail itself of the invitation at the next opportunity.

The next meeting of the Provincial Council was decided to be held in January, 1942, at Coimbatore, the date to be fixed in consultation with the Coimbatore District Medical Association.

Other subjects :—

(*a*) Election of the Vice-president and the Secretary for 1941-42.

The council felt that as the one year term of office of membership of many of the representatives of the member-branches expires with the end of the calender year the election must be made by the newly constituted council for the year 1941-42.

The Secretary was, therefore, althorised to request the several branches to elect their representatives well before 31-12-41.

(*b*) The council resolved that a certified auditor be engaged to audit the accounts of the Provincial Branch from its inception to 31-12-41 and on the motion of the Secretary appointed Mr. R. Seshan, G.D.A., for the purpose.

The following resolution was passed unanimously:—

Resolution No. V. This council places on record its great appreciation of the services rendered to this infant association by Dr. D. V. Venkappa, the outgoing President.

After a vote of thanks to Dr. P. A. S. Raghavan and the office-bearers and members of the Trichinopoly branch for their hospitality, the meeting came to a close at 10-30 a.m.

PUNJAB PROVINCIAL BRANCH—The last meeting of the Executive Committee was held at the residence of Dr. Hans Raj Sud, Jullundur City, on 2-11-1941 at 5-30 p.m. with R. S. Dr. S. N. Kaul in the chair.

The following members were present:—R.S. Dr. S. N. Kaul, Dr. Prem Nath, Dr. B. L. Kapur—Lahore Branch; Dr. Hans Raj Sud—Jullunder Branch; Dr. Dalip Chand Bahl—Ambala Cantt.

1. Proceedings of the last meeting were read and confirmed.

2. Ten letters were received from different branches in connection with the election of the President for the year 1941-42. One vote was discarded, being received after the fixed date, and nine were counted with the following results:

1.	Captain R. C. Goulatia, Lahore ..	4 votes.
2.	Dr. Nihal Chand Sikri, Lahore ..	2 „
3.	Dr. K. R. Chawdhury, Lahore	1 vote.
4.	Dr. Baldev Singh, Amritsar	1 „

Capt. R. C. Goulatia, Lahore, was declared President for the year 1941-42 by majority of votes.

3. Resolved that Lahore and Jullunder branches be reminded to clear off the arrears for the year 1940-41 at the earliest time.

(*b*) The secretaries of the branches are advised to strictly adhere to the rules No. 14-18 of the Indian Medical Association and, in this connection, they are to inform the Provincial office at the termination of the first three months of the Association year, the names of the members who have not paid their subscription, so that their journals may be stopped. A copy of the same be sent to the Central Office for information.

Resolved that, on account of the war conditions, one day conference be held on the 23rd November, 1941, beginning at 9 a.m. and finishing at 4 p.m. The Secretary, Lyallpore branch, be informed to chalk out the programme. If the Lyallpore branch has arranged an exhibition, they can carry on the exhibition work on the 22nd November, 1941.

4. The Audited Accounts of the Indian Medical Association, Punjab Provincial branch, for the year ending 30th September, 1941, and the Supplementary Account up to and including 31st October, 1941, were accepted and passed.

The meeting terminated with a vote of thanks to the President, R. S. Dr. S. N. Kaul, and the host, Dr. Hans Raj Sud.

KISHANGANJ BRANCH—Meeting of the local medical practitioners with registrable qualifications held on 29-5-41 to form a branch of the I. M. A. at Kishanganj.

A branch was opened with Dr. K. N. Moitra, L.M.S. as President and Dr. R. N. Sinha, M.B., B.S., Civil Assistant Surgeon, as the Secretary. 12 medical practitioners enrolled as members on the same day.

A meeting of the Executive Committee was held on 6-6-41, when a sub-committee was formed to frame the rules and regulations of the Branch.

It was resolved that all doctors in the Sub-division possessing registrable qualifications be approached for being enrolled as members of the I. M. A. through the branch.

The Rules Sub-Committee met on 17-6-41 and drafted the rules and regulations, which were subsequently adopted by the Executive Committee at their meeting held on 13-7-41 and a copy of which was forwarded to the Central Headquarters at Calcutta and the Provincial Headquarters at Patna for information and record.

A meeting of the Branch was held on 22-8-41 to consider a letter form the Hony. Gen. Secretary, Indian Medical Association, regarding the legal and basic rights of a medical practitioner to accept or refuse a call.

Other matters touching medical ethics were also discussed.

SOUTH ARCOT BRANCH—Monthly meeting held on 23-8-41, at the Government Hospital, Villupuram, with the President in the chair:

Read a letter from the General Secretary, dated 9-8-41.

The house adopted the following resolutions:

1. This Association learns with sorrow of the death of Dr. Rabindra Nath Tagore, the illustrious son of India.

2. This Association learns with sorrow of the sudden death of Dr. F. Rheneus, Lady Doctor in charge of the maternity work of the Cuddalore Municipality.

Resolved to communicate the above resolutions to members of the bereaved family.

Dr. S. Chandrasekharan reported the following cases: 1. Burn and its treatment; 2. Strangulated femoral hernia; 3. Sliding inguinal herniæ; 4. Osteomyelitis lower third of femur; 5. Hodgkin's disease; 6. Acute hæmorrhagic pancreatitis; 7. Paraovarian cyst.

Dr. S. Sundaresan, Resident Medical Officer of the Government Head Quarters Hospital, Cuddalore, delivered a lecture on General Anæsthesias. He laid emphasis on a thorough examination of the patient and described in detail the various stages and pitfalls in the induction of anæsthesia. He pleaded for co-operation between the surgeon and the anæsthetist. In conclusion, he laid stress on the causes of shock, primary cardiac failure, and the importance of keeping the airways clear.

Dr. S. Chandrasekharan spoke on local anæsthesia, the regional block and the nerve block.

Dr. S. Sankara Raman classified anæsthesia into local, general and spinal and discussed, in great detail, the various types of anæsthesias in vogue.

An interesting discussion ensued in which all members took part.

The President, in his concluding remarks, gave his experiences of the various forms of anæsthesia and laid emphasis on the choice depending on the nature of the operation and the general condition of the patient.

Dr. Y. Dhanapathy, the Hon. Medical Officer of the Villupuram Hospital was At Home to the members.

KRISHNAGAR BRANCH—The Bijoya-Dasami Party was convened on the 4-10-41. All the members, excepting one, were present.

Resolved that the members of this branch of the Indian Medical Association, assembled in the Bijoya Dasami Party, especially convened for exchange of Bijoya Greetings amongst the members, convey their Bijoya Greetings to all members of the various branches of the Indian Medical Association.

Report of the Activity for 1940-41—This branch was started in 1939 with 5 members which have been increased to 11 this year. There were 7 ordinary meetings, one condolence meeting for late Dr. S. K. Mukherji and 1 picnic party. The picnic party was held outside the town in a garden; all members attended. It was a very pleasing function. It is very gratifying to record that the members of this branch have taken up the Lahore resolution regarding Insurance cases. They have resolved and are firmly determined not to examine any insurance case on a fee less than Rs. 8 per 1,000. A letter, signed by the members, has been sent through the Hon. General Secretary, I.M.A., to the President of the Indian Life Insurance Company's Association, requesting the latter for an increase in the scale of fees to Rs. 8 per 1,000 and, if they cannot do so, to accept the letter as one of resignation by the members of this branch of I.M.A. to their appointments as medical examinees of all companies.

The various branches of the I.M.A. are requested to note and follow the steps taken up by this branch.

AMBALA CANTT. BRANCH—At a meeting held under the presidentship of Dr. Shamboo Nath Tandon, at the clinic of Dr. A. C. Manivan on 16-10-41 at 4 p.m., the following resolutions were passed:—

1. Resolved that the E. O., Cantt. Board, Ambala Cantt., to requested not to prefix the word "Doctor" before the names of unqualified persons or quacks other than qualified registered medical practitioners or with those with university degrees.

2. Resolved that a letter to protest against the Vendor License be addressed to E. O., Cantt. Board, signed by all members of I.M.A.

3. The members of I.M.A., Ambala Cantt. Branch unanimously re-elect Capt. R. C. Goulatia, M.B.B.S., as Provincial President for year 1941-42 *vide* Letter No. 986|10|7|I.M.A., dated 5th October, 1941, from P. P. Hony. Secy.

4. Letter No. 69, dated 19-9-41 from the Central Office, Calcutta was read and noted.

5. Resolved that Dr. B. K. Mukerji, Ambala Cantt., who tendered his resignation on 12-2-41, be asked to send Rs. 3 only instead of Rs. 6, as subscription for the period ending 31-3-41, as he was supplied with the *Journal of the Indian Medical Association* from October, 1940 up to March, 1941.

6. The resolution moved by Dr. Dalip Chand Bahl about Defence Regulation 32|B was passed unanimously by the members of I.M.A., Ambala Cantt. Branch. The Secretary should despatch the copies to the Provincial and Central Offices as early as possible.

Copy of letter dated 7-1-41 Ref. No. M|1|7|7438 dated 15-9-41, from Dr. S. Hamid Ali Hony. Secretary, Ambala Branch to the Executive Officer, Cantt. Board, Ambala Cantt.

Dear Sir,

Your notice under Sec. 210|3|A of Cantt. Act 1924, does not apply to us as we do not deal in drugs and medicines of a perishable nature. The Sec. 210|1|I is not applicable to Regtd. Medical practitioners as we practise with a license.

Will you please cancel the notice served on us for the above reasons.

Thanking you very much. Yours etc.

AMBALA CANTT. BRANCH—At a meeting held under the presidentship of Dr. Shamboo Nath Tandon at the clinic of Dr. B. L. Sood on 1st November, 1941, the following resolutions were passed:—

1. Resolved the amended resolution be sent to the E. O., Cantt. Board, Ambala Cantt., *vide* resolution No. 3 of the last meeting.

2. Letter from Capt. R. C. Goulatia, member, Punjab Medical Council was read in the house and the following resolutions, proposed by Dr. S. Hamid Ali and seconded by Dr. A. M. Deva, be forwarded to him to move in the next meeting of the Council.

(*a*) Resolved that strong action should be taken against the quacks and non-medical men practising in Medicine and Surgery in the province.

(*b*) Resolved that the word "Doctor" should not be allowed to be used frequently by every one except as a courtesy title to the Registered medical practitioner or with those with University Doctorate.

3. Letter No. 169|A I. 41, dated 26th October, 1941, from the Secretary B. D. Womens' Hospital, Ambala Cantt. was read in the house.

Resolved that the suggestion to improve the Hospital and to make it more useful to the public should be sent individually by all members of I.M.A. of the branch.

4. Resolved that a sum of Rs. 4 only should be awarded to Sajjan Singh in appreciation of his good services rendered to the Indian Medical Association Ambala Cantt. Branch during 1940-41.

5. Agenda of Provincial Executive meeting to be held at Jullunder on 2nd November, 1941, was read in the house.

6. Resolved that E. O. Cantt. Board Ambala be requested to ask the Dhabawallas and rotiwallas to fix up chimneys on their chullas, etc., as the smoke is dangerous for the public safety. He may further be requested to take strong action against those sweetmeat sellers who use ordinary colours in sweetmeats and against those fruit sellers who sell rotten and unripe fruits specially in the evening.

With a vote of thanks to the chair and Dr. B. L. Sood for the light refreshments, the meeting came to an end.

SIWAN BRANCH—An emergent meeting held on 21-10-1941 in the premises of Dr. Kali Prosad:

It was unanimously resolved that a condolence message be sent to Dr. Gaya Prasad on his father's bereavement.

Resolved that the papers submitted by the President, Dr. Mohammad Hassan, be sent, in original, to the Hony. General Secretary, Indian Medical Association, Calcutta, for eliciting opinion of the other branches regarding the desirability of allowing members of the profession who passed out of national medical institutions in 1912-16 to be enrolled as members of I.M.A.

Considered letters dated 9-10-41 and 13-10-41 from Hony. Joint Secretary, Behar Provincial Branch, Patna, and resolved that Dr. A. Rahman be requested to represent the Siwan Branch at the meeting convened on 24-11-41 at Patna to receive Dr. K. S. Ray President, and Capt. P. B. Mukerji Hony. General Secretary, I.M.A., and to place the views of the branch on the other items of business in the Agenda.

DACCA BRANCH—Proceedings of an Emergent Meeting held on 12-11-41 with Dr. J. C. Das (President) in the chair:

Proceedings of the last meeting were confirmed.

Resolved that the members of the Indian Medical Association, Dacca Branch, unanimously disapprove of and condemn the action of the local authorities for not issuing permits to medical men on their professional calls during all "Curfew Orders." It is further noted that the permits were refused in serious or emergent cases, even on approach personally by some members of the profession.

It is further resolved that a copy of the resolution be sent to (1) the Hony. General Secretary, Indian Medical Association; (2) Hony. Jt. Secretaries, Indian Medical Association, Bengal Provincial Branch, Calcutta; and (3) Hon'ble Home Minister to the Government of Bengal for information and necessary action.

Resolved that, in view of His Majesty's Government in Great Britain having passed under Defence Regulation 32-B an .order .on .the 1st January, 1941, by which medical qualifications granted, amongst other states and territories, in the provinces of India to be temporarily registrable in the United Kingdom, this Association requests the Indian Medical Council to recognise all qualifications registrable with the Provincial Medical Councils of India so that the members holding those qualifications may be eligible for the King's Commission, *i.e.*, I.M.S.

That this Association requests the Working Committee and the Central Council of the I.M.A. to approach the authorities concerned and also give mandate to those members of the I.M.A., who are members of the I.M.C. to pass the same.

MAUDRA MEDICAL ASSOCIATION (MADURA BRANCH, I.M.A.)—Proceedings of the monthly meeting held on 21-11-41, at the W. P. P. M. Hospital at 5 p.m. with Lt. Col. A. I. Cox, I.M.S., in the chair:

The medical officer and staff of the W. F. P. M. Hospital were "At Home" to the members.

The following were elected to the Provincial Council of the I.M.A. for 1942. (1) Dr. P. Vadamalayan, (2) Dr. M. V. Natesan, (3) Dr N Krishnamurthy, (Secretary).

As regards election of delegates, the Secretary was authorised to ascertain as to who were willing to attend the conference at their own expense and arrange accordingly.

Dr. G. T. Sundaram demonstrated the following cases of clinical interest: (1) Parkinson's Disease. (2) Syphilitic Hepatitis. (3) Diabetic Neuritis.

Dr. F. W. Wilder demonstrated a few skiagrams of interest.

* * * *

Proceedings of the monthly meeting held on 11-12-41 at the Erskine Hospital Madura with Lt. Col. A. I. Cox I.M.S. in the Chair:

Dr. R. G. Cochrane, M.D., M.R.C.P., D.T.M. & H. Chief Medical Officer, Leprosy Sanatorium, Chingleput, delivered a lecture on Childhood Leprosy. The lecturer dealt with in detail the incidence of leprosy in children and stressed how important it is to see that the children are removed from contacts. When in doubt, the said, it is best to treat it as leprosy and that too thoroughly.

Injections, both intramuscular and intradermal, are advocated. The latter, though painful, is preferable, if the patch is a small one; ½ to 1 c.c. per 10 lbs. of body weight is the dose. Oral administration of the oil (5 minims in a lump of sugar, three times a day) may be given.

A few questions put by the members were answered by the lecturer.

TINNEVELLY DISTRICT MEDICAL ASSOCIATION (TINNEVELLY BRANCH, I.M.A.)—Minutes of the monthly meeting held at the Subramania Karayalar Public Library, Palamcottah, on 21-12-41 under the presidentship of Capt. U. Ananthya, M.B. & C.M.:

Members numbering 23, including two women doctors were present.

The Secretary & Treasurer read out the minutes of the Annual Re-union held at Palamcottah on the 29th November, 1941, which were passed.

Capt. U. Ananthaya, M.B. & C.M., read out the speech delivered by the Surgeon-General with the Government of Madras, exhorting the medical practitioners to take up appointments in the I.M.D. and I.M.S. He also gave an elaborate lecture on Air Raid Precautions.

Dr. K. Rama Ayyar, M.B.B.S., Hony. Asst. Medical Officer, Government Headquarters Hospital, Palamocottah, read out case notes on diphtheria. He also showed two interesting skigrams (1) Gun shot injury—chest, (2) Foreign body—œsophagus. All the members took part in the discussion.

The President gave an account of his experience and explained the details of treatment etc., in a brief speech.

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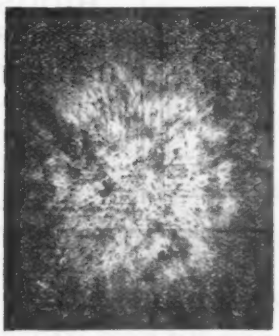
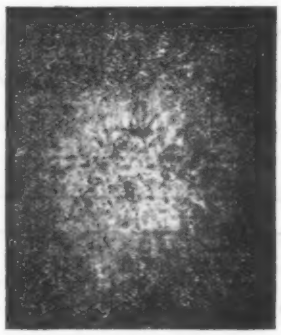
Bearing A—10 hours of operation. The fact that the visible bearing surface covers the entire film and that there are numerous large dark areas forming a pattern of peaks and valleys indicate that the surface of this bearing is a good deal rougher than



Bearing B—40 hours of operation. The fact that the visible bearing surface is considerably smaller is evidence that the surface of this bearing is more nearly round and relatively smooth. The number of large dark areas, however, and particularly the long black line in the upper left corner tell us that it is not nearly as smooth as



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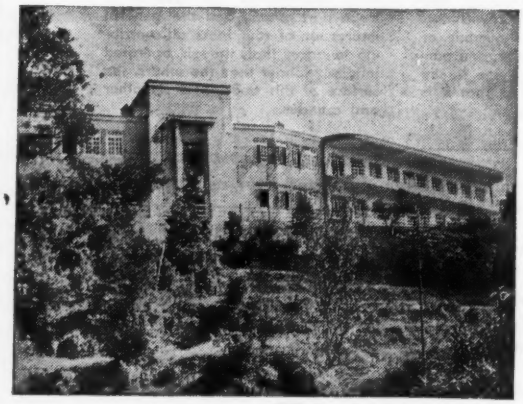

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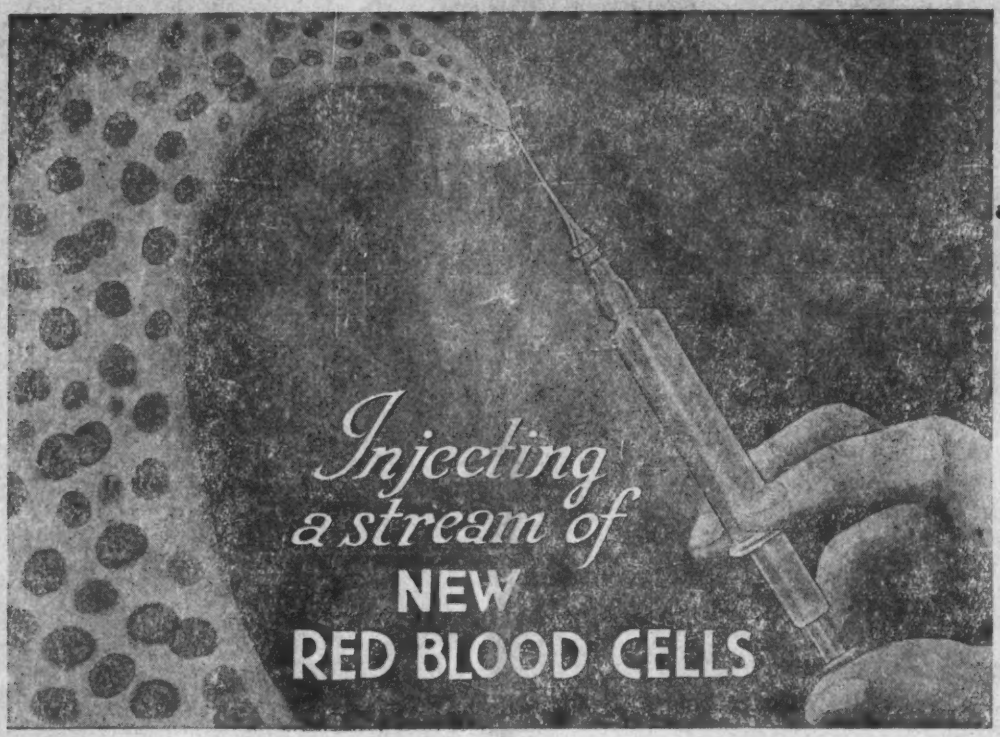

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